



#4 Seebon

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Samir Kumar BRAHMACHARI et al.

Appln. No.: 09/820,843

Group Art Unit: Not Yet Assigned

Filed: March 30, 2001

Examiner: Not Yet Assigned

Confirmation number: 7045

For: A COMPUTATIONAL METHOD FOR THE IDENTIFICATION OF CANDIDATE  
PROTEINS USEFUL AS ANTI-INFECTIVES

STATEMENT TO SUPPORT FILING AND SUBMISSION IN  
ACCORDANCE WITH 37 C.F.R. §§ 1.821-1.825

Assistant Commissioner for Patents  
Washington, D.C. 20231  
**Box SEQUENCE**

Sir:

In connection with a Sequence Listing submitted concurrently herewith, the undersigned  
hereby states that:

1. the submission, filed herewith in accordance with 37 C.F.R. § 1.821(g), does not  
include any new matter;
2. the content of the attached paper copy and the attached computer readable copy of  
the Sequence Listing, submitted in accordance with 37 C.F.R. § 1.821(c) and (e), respectively,  
are the same; and
3. all statements made herein of my own knowledge are true and that all statements  
made on information and belief are believed to be true, and further, that these statements were  
made with the knowledge that willful false statements and the like so made are punishable by

**C**

fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

02

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## SEQUENCE LISTING

<110> Council of Scientific and Industrial Research

<120> A COMPUTATIONAL METHOD FOR THE IDENTIFICATION OF CANDIDATE PROTEINS  
USEFUL AS ANTI-INFECTIVES

<130> 063915

<160> 118

<170> PatentIn version 3.0

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<212> PRT

<213> C. jejuni

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<221> misc feature

<223> highly acidic protein

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<223> gi | 6967728

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Glu Asp Glu Glu Tyr Pro Gln Asn His His Lys Asn Tyr Asn Tyr Asp  
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Asp Asp Asp Tyr Glu Tyr Asp Asp Asp Asn Asn Asp Asp Asp Phe Tyr  
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Glu Met Asp  
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<213> C. jejuni

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<223> gi | 6969129

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Ile Ile Gly Phe Gly Gly Ile Val Phe Val Val Thr Lys Glu Lys Lys  
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<211> 57

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<213> C. jejuni

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<221> misc\_feature

<223> putative coiled coil protein

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<223> gi|6968493

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Leu Asn Asn Gln Glu Leu Ala Leu Asp Glu Ser Val Lys Ile Tyr Lys  
20 25 30

Glu Gly Leu Glu Ser Ile Lys Lys Ala Arg Leu Glu Leu Glu Lys Ala  
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Lys Leu Glu Val Glu Gln Ile Asp Glu  
50 55

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<213> C. jejuni

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Ser	Leu	Ser	Ala	Lys	Lys	Met	Ser	Tyr	Asp	Phe	Glu	Glu	Leu	Asn	Ala	20	25	30	
Tyr	Ser	Glu	Asn	Leu	Gly	Asn	Tyr	Asp	Val	Ile	Val	Val	Asp	Ser	Asp	35	40	45	
Thr	Pro	Ala	Pro	Leu	Lys	Ile	Leu	Lys	Glu	Lys	Cys	Asp	Arg	Leu	Ile	50	55	60	
Phe	Leu	Ala	Pro	Arg	Asn	Gln	Asn	Val	Glu	Asp	Ile	Asp	Ala	Gln	Ile	65	70	75	80
Leu	Gln	Lys	Pro	Phe	Leu	Pro	Thr	Asp	Phe	Leu	Asn	Leu	Leu	Asn	Asn	85	90	95	
Lys	Asp	Ala	Asn	Lys	His	Thr	Ser	Ile	Asp	Leu	Pro	Met	Leu	Ser	Asn	100	105	110	
Asp	Glu	Asn	Pro	Tyr	Ala	Asp	Ile	Ser	Leu	Asp	Leu	Asp	Asn	Leu	Asn	115	120	125	
Leu	Asp	Asp	Leu	Pro	Asp	Glu	Asn	Ser	Leu	Asp	Ile	Asn	Ser	Glu	Gly	130	135	140	
Met	Glu	Asp	Leu	Ser	Phe	Asp	Asp	Asp	Ala	Gln	Asp	Asp	Asn	Ala	Asn	145	150	155	160
Lys	Thr	Leu	Glu	Thr	Gln	Asn	Leu	Glu	His	Glu	Thr	Ile	Lys	Glu	Gln	165	170	175	
Thr	Gln	Glu	Asp	Thr	Gln	Ile	Asp	Leu	Asp	Leu	Thr	Leu	Glu	Asp	Gly	180	185	190	
Glu	Ser	Glu	Lys	Glu	Asp	Leu	Ser	Gln	Glu	His	Thr	Ala	Leu	Asp	Thr	195	200	205	
Glu	Pro	Ser	Leu	Asp	Glu	Leu	Asp	Asp	Lys	Asn	Asp	Glu	Asp	Leu	Glu	210	215	220	
Ile	Lys	Glu	Asp	Asp	Lys	Asn	Glu	Glu	Ile	Glu	Lys	Gln	Glu	Leu	Leu	225	230	235	240
Asp	Asp	Ser	Lys	Thr	Asn	Thr	Leu	Glu	Met	Gln	Glu	Glu	Leu	Ser	Glu	245	250	255	
Ser	Gln	Asp	Asp	Asn	Ser	Asn	Lys	Thr	Leu	Glu	Thr	Gln	Asn	Leu	Glu	260	265	270	
His	Asp	Asn	Leu	Glu	Gln	Glu	Thr	Ile	Lys	Glu	Gln	Thr	Gln	Glu	Asp	275	280	285	

Thr Gln Ile Asp Leu Asp Leu Thr Leu Glu Asp Gly Glu Ser Glu Lys  
 290 295 300  
 Glu Asp Leu Ser Gln Glu His Thr Ala Leu Asp Thr Glu Pro Ser Leu  
 305 310 315 320  
 Asp Glu Leu Asp Asp Lys Asn Asp Glu Asp Leu Glu Asp Asn Lys Glu  
 325 330 335  
 Leu Gln Ala Asn Ile Ser Asp Phe Asp Asp Leu Pro Glu Val Glu Glu  
 340 345 350  
 Gln Glu Lys Glu Met Asp Phe Asp Asp Leu Pro Glu Asp Ala Glu Phe  
 355 360 365  
 Leu Gly Gln Ala Lys Tyr Asn Glu Glu Ser Glu Glu Asn Leu Glu Glu  
 370 375 380  
 Phe Ala Pro Val Val Glu Glu Asp Ile Gln Asp Glu Ile Asp Asp Phe  
 385 390 395 400  
 Ala Ser Asn Leu Ser Thr Gln Asp Gln Ile Lys Glu Glu Leu Ala Gln  
 405 410 415  
 Leu Asp Glu Leu Asp Tyr Gly Ile Asp Ser Asp Asn Ser Ser Lys Val  
 420 425 430  
 Leu Glu Asp Phe Lys Asp Glu Pro Ile Leu Asp Asp Lys Glu Leu Gly  
 435 440 445  
 Thr Asn Glu Glu Glu Val Val Val Pro Asn Leu Asn Ile Ser Asp Phe  
 450 455 460  
 Asp Thr Leu Lys Glu Ser Asp Ile Gln Glu Ala Leu Gly Glu Glu Ile  
 465 470 475 480  
 Leu Glu Lys Asn Glu Glu Pro Ile Val Ser Asp Val Thr Lys Asp Asp  
 485 490 495  
 Asn Ser Glu Glu Ile Val Asn Glu Leu Ser Gln Ser Ile Ala Gly Ala  
 500 505 510  
 Ile Thr Ser Ser Ile Lys Asp Asp Thr Leu Lys Ala Ala Leu Lys Gly  
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 <213> C. pneumoniaeCWL029  
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<223> gi|4376663

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Lys Ala Thr Val Arg Lys Thr Ala Val Lys Lys Pro Ala Val Arg Lys  
35 40 45

Thr Ala Ala Lys Lys Thr Val Ala Lys Lys Thr Thr Ala Lys Arg Thr  
50 55 60

Val Arg Lys Thr Val Ala Lys Lys Pro Ala Val Lys Lys Val Ala Ala  
65 70 75 80

Lys Arg Val Val Lys Lys Thr Val Ala Lys Lys Thr Thr Ala Lys Arg  
85 90 95

Ala Val Arg Lys Thr Val Ala Lys Lys Pro Val Ala Arg Lys Thr Thr  
100 105 110

Val Ala Lys Gly Ser Pro Lys Lys Ala Ala Ala Cys Ala Leu Ala Cys  
115 120 125

His Lys Asn His Lys His Thr Ser Ser Cys Lys Arg Val Cys Ser Ser  
130 135 140

Thr Ala Thr Arg Lys His Gly Ser Lys Ser Arg Val Arg Thr Ala His  
145 150 155 160

Gly Trp Arg His Gln Leu Ile Lys Met Met Ser Arg  
165 170

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<213> C. trachomatis

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<223> hypothetical protein-possible frameshift with CT593

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<221> misc\_feature

<223> gi|3522902

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Met Phe Thr Leu Phe Leu Cys Glu His Leu Leu Thr Asn Ile Leu Ala  
1 5 10 15

Ser Ser Phe Leu Ala Lys Ser Gln Gly Phe Ile Thr Leu Val Asn Leu  
20 25 30

Phe His Lys Ile Pro Gly Leu Lys Val Ile Glu Ile Thr Cys Leu Ala  
35 40 45

Leu Pro Leu Gly Ile His Ser Ile Ile Gly Phe Ser Tyr Leu Leu  
50 55 60

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<212> PRT

<213> C. trachomatis

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<223> histone like protein 2

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<223> gi|3328438

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Met Asn Met Leu Gly Val Gln Lys Lys Cys Ser Thr Arg Lys Thr Ala  
1 5 10 15

Ala Arg Lys Thr Val Val Arg Lys Pro Ala Ala Lys Lys Thr Ala Ala  
20 25 30

Lys Lys Ala Pro Val Arg Lys Val Ala Ala Lys Lys Thr Val Ala Arg  
35 40 45

Lys Thr Val Ala Lys Lys Thr Val Ala Ala Arg Lys Pro Val Ala Lys  
50 55 60

Lys Ala Thr Ala Lys Lys Ala Pro Val Arg Lys Val Ala Ala Lys Lys  
65 70 75 80

Thr Val Ala Arg Lys Thr Val Ala Lys Lys Thr Val Ala Ala Arg Lys  
85 90 95

Pro Val Ala Lys Lys Ala Thr Ala Lys Lys Ala Pro Val Arg Lys Ala  
100 105 110



Val Ala Lys Lys Thr Val Ala Arg Lys Thr Val Ala Lys Lys Thr Val  
115 120 125

Ala Ala Arg Lys Pro Val Ala Lys Arg Val Ala Ser Thr Lys Lys Ser  
130 135 140

Ser Ile Ala Val Lys Ala Gly Val Cys Met Lys Lys His Lys His Thr  
145 150 155 160

Ala Ala Cys Gly Arg Val Ala Ala Ser Gly Val Lys Val Cys Ala Ser  
165 170 175

Ala Ala Lys Arg Lys Thr Asn Pro Asn Arg Ser Arg Thr Ala His Ser  
180 185 190

Trp Arg Gln Gln Leu Met Lys Leu Val Ala Arg  
195 200

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<213> H. influenzae

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<223> outer membrane integrity protein (tolA)

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1 5 10 15

Ile Leu Leu His Phe Ile Leu Phe Gly Leu Leu Ile Leu Ser Ser Leu  
20 25 30

Tyr His Thr Val Glu Ile Met Gly Gly Gly Glu Gly Glu Gly Asp Val  
35 40 45

Ile Gly Ala Val Ile Val Asp Thr Gly Thr Ala Ala Gln Glu Trp Gly  
50 55 60

Arg Ile Gln Gln Gln Lys Lys Gly Gln Ala Asp Lys Gln Lys Arg Pro  
65 70 75 80

Glu Pro Val Val Glu Glu Lys Pro Pro Glu Pro Asn Gln Glu Glu Ile  
85 90 95

Lys His Gln Gln Glu Val Gln Arg Gln Glu Glu Leu Lys Arg Gln Gln  
100 105 110

Glu	Gln	Gln	Arg	Gln	Gln	Glu	Ile	Lys	Lys	Gln	Gln	Glu	Gln	Ala	Arg
115				120				125							
Gln	Glu	Ala	Leu	Glu	Lys	Gln	Lys	Gln	Ala	Glu	Glu	Ala	Lys	Ala	Lys
130				135				140							
Gln	Ala	Ala	Glu	Ala	Ala	Lys	Leu	Lys	Ala	Asp	Ala	Glu	Ala	Lys	Arg
145				150				155				160			
Leu	Ala	Ala	Ala	Ala	Lys	Gln	Ala	Glu	Glu	Glu	Ala	Lys	Ala	Lys	Ala
165				170				175							
Ala	Glu	Ile	Ala	Ala	Gln	Lys	Ala	Lys	Gln	Glu	Ala	Glu	Ala	Lys	Ala
180				185				190							
Lys	Leu	Glu	Ala	Glu	Ala	Lys	Ala	Lys	Ala	Val	Ala	Glu	Ala	Lys	Ala
195				200				205							
Lys	Ala	Glu	Ala	Glu	Ala	Lys	Ala	Lys	Ala	Ala	Ala	Glu	Ala	Lys	Ala
210				215				220							
Lys	Ala	Asp	Ala	Glu	Ala	Lys	Ala	Ala	Thr	Glu	Ala	Lys	Arg	Lys	Ala
225				230				235				240			
Asp	Gln	Ala	Ser	Leu	Asp	Asp	Phe	Leu	Asn	Gly	Gly	Asp	Ile	Gly	Gly
245				250				255							
Gly	Ser	Ala	Ser	Lys	Gly	Gly	Asn	Thr	Asn	Lys	Gly	Gly	Thr	Gln	Gly
260				265				270							
Ser	Gly	Ala	Ala	Leu	Gly	Ser	Gly	Asp	Gly	Gly	Lys	Val	Gly	Asp	Gln
275				280				285							
Tyr	Ala	Gly	Val	Ile	Lys	Lys	Glu	Ile	Gln	Arg	Arg	Phe	Leu	Lys	Asp
290				295				300							
Pro	Asn	Phe	Ala	Gly	Lys	Val	Cys	Arg	Ile	Lys	Ile	Gln	Leu	Gly	Arg
305				310				315				320			
Asp	Gly	Thr	Ile	Leu	Gly	Tyr	Gln	Lys	Ile	Ser	Gly	Ser	Asp	Asp	Ile
325				330				335							
Cys	Ser	Ala	Ala	Leu	Ser	Ala	Val	Ala	Arg	Thr	Lys	Lys	Val	Pro	Ala
340				345				350							
Ala	Pro	Ser	Asp	Glu	Ile	Tyr	Glu	Lys	Tyr	Lys	Ser	Pro	Ile	Ile	Asp
355				360				365							
Phe	Asp	Ile	Arg												
370															

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<221> misc\_feature

<223> thiamin ABC transporter, permease protein, putative

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Gly Gly Val Val Val Ile Ser Phe Ile Ile Leu Phe Tyr Gly Gly Ala  
20 25 30

Leu Ser Ser Ile Phe Ala Leu Gly Gly Glu Leu Gln Trp Arg Ala Trp  
35 40 45

Phe Thr Asp Asp Tyr Leu Gln His Leu Ile Leu Phe Ser Phe Gly Gln  
50 55 60

Ala Leu Leu Ser Thr Val Leu Ser Ile Phe Phe Gly Leu Leu Leu Ala  
65 70 75 80

Arg Ala Leu Phe Tyr Lys Pro Phe Leu Gly Lys Lys Trp Leu Leu Lys  
85 90 95

Leu Met Ser Leu Thr Phe Val Leu Pro Ala Leu Val Val Ile Phe Gly  
100 105 110

Leu Ile Gly Ile Tyr Gly Ser Ser Gly Trp Leu Ala Trp Leu Ala Asn  
115 120 125

Leu Phe Gly Met Ser Trp Gln Gly His Ile Tyr Gly Leu Ser Gly Ile  
130 135 140

Leu Ile Ala His Leu Phe Phe Asn Ile Pro Leu Ala Ala Gln Leu Phe  
145 150 155 160

Leu Gln Ser Leu Gln Ser Ile Pro Tyr Gln Gln Arg Gln Leu Ala Ala  
165 170 175

Gln Leu Asn Leu Gln Gly Trp Gln Phe Val Lys Leu Val Glu Trp Pro  
180 185 190

Val Phe Arg Gln Gln Cys Leu Pro Thr Phe Ser Leu Ile Phe Met Leu  
195 200 205

Cys Phe Thr Ser Phe Thr Val Val Leu Thr Leu Gly Gly Gly Pro Gln  
210 215 220

Tyr Thr Thr Leu Glu Thr Ala Ile Tyr Gln Ala Ile Leu Phe Glu Phe  
 225 230 235 240  
 Asp Leu Pro Lys Ala Ala Leu Phe Ala Met Leu Gln Phe Val Phe Cys  
 245 250 255  
 Leu Ile Leu Phe Ser Leu Thr Ser Arg Phe Ser Leu Ser Asn Gln Asn  
 260 265 270  
 Gly Leu Ser Asn Ser Asn Ile Trp Phe Glu Lys Pro Lys Ser Ala Val  
 275 280 285  
 Lys Ile Phe His Ile Leu Val Leu Leu Val Phe Val Phe Phe Leu Phe  
 290 295 300  
 Ser Pro Val Leu Asn Ile Leu Ile Ser Ala Leu Ser Ser Ser Asn Leu  
 305 310 315 320  
 Leu Thr Val Trp His Asn Ser Gln Leu Trp Arg Ala Leu Gly Tyr Ser  
 325 330 335  
 Leu Ser Ile Ala Pro Leu Ser Ala Leu Leu Ala Leu Thr Met Ala Ile  
 340 345 350  
 Ala Leu Leu Leu Leu Ser Arg Arg Leu Glu Trp Leu His Tyr Gln Lys  
 355 360 365  
 Ile Ser Gln Phe Ile Ile Asn Ala Gly Met Val Ile Leu Ala Ile Pro  
 370 375 380  
 Ile Leu Val Leu Ala Met Gly Leu Phe Leu Leu Leu Gln Asp Arg Asp  
 385 390 395 400  
 Phe Ser Asn Ile Asp Leu Phe Ile Ile Val Val Phe Cys Asn Ala Leu  
 405 410 415  
 Ser Ala Met Pro Phe Val Leu Arg Ile Leu Ser Ala Pro Phe His Asn  
 420 425 430  
 Asn Met Arg Tyr Tyr Glu Asn Leu Cys Asn Ser Leu Gly Ile Val Gly  
 435 440 445  
 Trp Gln Arg Phe Tyr Leu Ile Glu Trp Lys Thr Leu Arg Ala Pro Leu  
 450 455 460  
 Arg Tyr Ala Phe Ala Leu Gly Leu Ala Leu Ser Leu Gly Asp Phe Thr  
 465 470 475 480  
 Ala Ile Ala Leu Phe Gly Asn Gln Glu Phe Thr Ser Leu Pro His Leu  
 485 490 495  
 Leu Tyr Gln Gln Leu Gly Asn Tyr Arg Asn Gln Asp Ala Ala Val Thr  
 500 505 510

Ala Gly Ile Leu Leu Leu Leu Cys Gly Ile Leu Phe Ala Phe Ile His  
515 520 525

Thr Tyr Arg Asp Ala Asp Asp Leu Ser Lys  
530 535

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Lys Asn Ala Glu Ile Leu Asn Pro Leu Trp Phe Phe Leu Leu Val Ile  
20 25 30

Thr Leu Phe Pro Leu Val Ile Gly Pro Asp Pro Lys Leu Leu Ser Arg  
35 40 45

Ile Ala Pro Gly Ile Ala Trp Val Ala Ala Leu Leu Ser Ala Leu Leu  
50 55 60

Ser Phe Glu Arg Leu Phe Arg Asp Asp Phe Ile Asp Gly Ser Leu Glu  
65 70 75 80

Gln Leu Met Leu Thr Ala Gln Pro Leu Pro Met Thr Ala Leu Ala Lys  
85 90 95

Val Val Ala His Trp Leu Leu Thr Gly Leu Pro Leu Ile Leu Leu Ser  
100 105 110

Pro Ile Ala Ala Leu Leu Leu Ser Leu Glu Val Asn Ile Trp Trp Ala  
115 120 125

Leu Val Leu Thr Leu Leu Leu Gly Thr Pro Val Leu Ser Cys Ile Gly  
130 135 140

Ala Ile Gly Val Ala Leu Thr Val Gly Leu Arg Lys Gly Gly Val Leu  
145 150 155 160

Leu Ser Leu Leu Val Val Pro Leu Phe Ile Pro Val Leu Ile Phe Ala  
165 170 175

Ser Ser Val Leu Glu Ala Ala Gly Leu Asn Val Pro Tyr Gly Gly Gln  
180 185 190

Leu Ala Ile Leu Gly Ala Met Met Val Gly Ala Val Thr Leu Ser Pro  
195 200 205

Phe Ala Ile Ala Ala Ala Leu Arg Ile Ser Leu Asp Asn  
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<223> recombination protein (rec2)

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Leu Thr Leu Leu Phe Leu Pro Gln Pro Leu Leu Leu Pro Trp Gln Val  
20 25 30

Ala Leu Val Ile Ala Leu Val Leu Ile Phe Leu Phe Ile Phe Leu Arg  
35 40 45

Arg Asn Phe Leu Val Ser Leu Ala Phe Phe Val Ala Ser Leu Gly Tyr  
50 55 60

Phe His Tyr Ser Ala Leu Ser Leu Ser Gln Gln Ala Gln Asn Ile Thr  
65 70 75 80

Ala Gln Lys Gln Val Val Thr Phe Lys Ile Gln Glu Ile Leu His Gln  
85 90 95

Gln Asp Tyr Gln Thr Leu Ile Ala Thr Ala Thr Leu Glu Asn Asn Leu  
100 105 110

Gln Glu Gln Arg Ile Phe Leu Asn Trp Lys Ala Lys Glu Val Pro Gln  
115 120 125

Leu Ser Glu Ile Trp Gln Ala Glu Ile Ser Leu Arg Ser Leu Ser Ala  
130 135 140

Arg Leu Asn Phe Gly Gly Phe Asp Arg Gln Gln Trp Tyr Phe Ser Lys

145		150		155		160
Gly Ile Thr Ala Val Gly Thr Val Lys Ser Ala Val Lys Ile Ala Asp						
	165			170		175
Val Ser Ser Leu Arg Ala Glu Lys Leu Gln Gln Val Lys Lys Gln Thr						
	180			185		190
Glu Gly Leu Ser Leu Gln Gly Leu Leu Ile Ala Leu Ala Phe Gly Glu						
	195			200		205
Arg Ala Trp Leu Asp Lys Thr Thr Trp Ser Ile Tyr Gln Gln Thr Asn						
	210			215		220
Thr Ala His Leu Ile Ala Ile Ser Gly Leu His Ile Gly Leu Ala Met						
	225			230		235
Gly Ile Gly Phe Cys Leu Ala Arg Val Val Gln Val Phe Phe Pro Thr						
	245			250		255
Arg Phe Ile His Pro Tyr Phe Pro Leu Val Phe Gly Val Leu Phe Ala						
	260			265		270
Leu Ile Tyr Ala Tyr Leu Ala Gly Phe Ser Val Pro Thr Phe Arg Ala						
	275			280		285
Ile Ser Ala Leu Val Phe Val Leu Phe Ile Gln Ile Met Arg Arg His						
	290			295		300
Tyr Ser Pro Ile Gln Phe Phe Thr Leu Val Val Gly Phe Leu Leu Phe						
	305			310		315
Cys Asp Pro Leu Met Pro Leu Ser Val Ser Phe Trp Leu Ser Cys Gly						
	325			330		335
Ala Val Gly Cys Leu Leu Leu Trp Tyr Arg Tyr Val Pro Phe Ser Leu						
	340			345		350
Phe Gln Trp Lys Asn Arg Pro Phe Ser Pro Lys Val Arg Trp Ile Phe						
	355			360		365
Ser Leu Phe His Leu Gln Phe Gly Leu Leu Leu Phe Phe Thr Pro Leu						
	370			375		380
Gln Leu Phe Leu Phe Asn Gly Leu Ser Leu Ser Gly Phe Leu Ala Asn						
	385			390		395
Phe Met Ala Val Pro Ile Tyr Ser Phe Leu Leu Val Pro Leu Ile Leu						
	405			410		415
Phe Ala Val Phe Thr Asn Gly Thr Met Phe Ser Trp Gln Leu Ala Asn						
	420			425		430
Lys Leu Ala Glu Gly Ile Thr Gly Leu Ile Ser Val Phe Gln Gly Asn						
	435			440		445

Trp Leu Thr Val Ser Phe Asn Leu Ala Leu Gly Leu Thr Ala Leu Cys  
 450 455 460  
 Ala Gly Ile Phe Met Leu Ile Ile Trp Asn Ile Tyr Arg Glu Pro Glu  
 465 470 475 480  
 Ile Ser Ser Ser Asn Trp Gln Ile Lys Arg Ala Lys Phe Phe Thr Leu  
 485 490 495  
 Asn Leu Ser Lys Pro Leu Leu Lys Asn Glu Arg Ile Asn Val Leu Arg  
 500 505 510  
 Cys Ser Phe Gly Ile Ile Leu Leu Cys Phe Thr Ile Leu Leu Phe Lys  
 515 520 525  
 Gln Leu Ser Lys Pro Thr Trp Gln Val Asp Thr Leu Asp Val Gly Gln  
 530 535 540  
 Gly Leu Ala Thr Leu Ile Val Lys Asn Gly Lys Gly Ile Leu Tyr Asp  
 545 550 555 560  
 Thr Gly Ser Ser Trp Arg Gly Gly Ser Met Ala Glu Leu Glu Ile Leu  
 565 570 575  
 Pro Tyr Leu Gln Arg Glu Gly Ile Val Leu Glu Lys Leu Ile Leu Ser  
 580 585 590  
 His Asp Asp Asn Asp His Ala Gly Gly Ala Ser Thr Ile Leu Lys Ala  
 595 600 605  
 Tyr Pro Asn Val Glu Leu Ile Thr Pro Ser Arg Lys Asn Tyr Gly Glu  
 610 615 620  
 Asn Tyr Arg Thr Phe Cys Thr Ala Gly Arg Asp Trp His Trp Gln Gly  
 625 630 635 640  
 Leu His Phe Gln Ile Leu Ser Pro His Asn Val Val Thr Arg Ala Asp  
 645 650 655  
 Asn Ser His Ser Cys Val Ile Leu Val Asp Asp Gly Lys Asn Ser Val  
 660 665 670  
 Leu Leu Thr Gly Asp Ala Glu Ala Lys Asn Glu Gln Ile Phe Ala Arg  
 675 680 685  
 Thr Leu Gly Lys Ile Asp Val Leu Gln Val Gly His His Gly Ser Lys  
 690 695 700  
 Thr Ser Thr Ser Glu Tyr Leu Leu Ser Gln Val Arg Pro Asp Val Ala  
 705 710 715 720  
 Ile Ile Ser Ser Gly Arg Trp Asn Pro Trp Lys Phe Pro His Tyr Ser  
 725 730 735



Val Met Glu Arg Leu His Arg Tyr Lys Ser Ala Val Glu Asn Thr Ala  
740 745 750

Val Ser Gly Gln Val Arg Val Asn Phe Phe Gln Asp Arg Leu Glu Ile  
755 760 765

Gln Gln Ala Arg Thr Lys Phe Ser Pro Trp Tyr Ala Arg Val Ile Gly  
770 775 780

Leu Ser Lys Glu  
785

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<223> gi|2313421

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Met Lys Met Ile Leu Phe Asn Gln Asn Pro Met Ile Thr Lys Leu Leu  
1 5 10 15

Glu Ser Val Ser Lys Lys Leu Glu Leu Pro Ile Glu Asn Phe Asn His  
20 25 30

Tyr Gln Glu Leu Ser Ala Arg Leu Lys Glu Asn Gln Glu Trp Leu Leu  
35 40 45

Ile Ala Asp Asp Glu Cys Leu Glu Lys Leu Asp Gln Val Asp Trp Leu  
50 55 60

Glu Leu Lys Glu Thr Ile Ser Gln Asn Lys Asn Ser Val Cys Met Tyr  
65 70 75 80

Lys Lys Gly Asn Glu Ala Gln Pro Phe Leu Glu Gly Phe Glu Val Lys  
85 90 95

Ile Lys Lys Pro Phe Leu Pro Thr Glu Met Leu Lys Val Leu Gln Lys  
100 105 110

Lys Leu Gly Ser Asn Ala Ser Glu Leu Glu Pro Ser Gln Asn Leu Asp  
115 120 125

Pro Thr Gln Glu Val Leu Glu Thr Asn Trp Asp Glu Leu Glu Asn Leu  
130 135 140

Gly	Asp	Leu	Glu	Ala	Leu	Val	Gln	Glu	Glu	Pro	Asn	Asn	Glu	Glu	Gln	145	150	155	160
Leu	Leu	Pro	Thr	Leu	Asn	Asp	Gln	Glu	Glu	Lys	Glu	Glu	Val	Lys	Glu	165	170	175	
Glu	Glu	Lys	Glu	Glu	Val	Lys	Glu	Glu	Glu	Lys	Glu	Glu	Val	Lys	Glu	180	185	190	
Glu	Glu	Lys	Glu	Glu	Val	Lys	Glu	Thr	Pro	Gln	Glu	Glu	Lys	Lys	Pro	195	200	205	
Lys	Asp	Asp	Glu	Thr	Gln	Glu	Gly	Glu	Thr	Leu	Lys	Asp	Lys	Glu	Val	210	215	220	
Ser	Lys	Glu	Leu	Glu	Ala	Pro	Gln	Glu	Leu	Glu	Ile	Pro	Lys	Glu	Glu	225	230	235	240
Thr	Gln	Glu	Gln	Asp	Pro	Ile	Lys	Glu	Glu	Thr	Gln	Glu	Asn	Lys	Glu	245	250	255	
Glu	Lys	Gln	Glu	Lys	Thr	Gln	Asp	Ser	Pro	Ser	Ala	Gln	Glu	Leu	Glu	260	265	270	
Ala	Met	Gln	Glu	Leu	Val	Lys	Glu	Ile	Gln	Glu	Asn	Ser	Asn	Gly	Gln	275	280	285	
Glu	Asn	Lys	Glu	Lys	Thr	Gln	Glu	Ser	Ala	Glu	Ile	Pro	Gln	Asp	Lys	290	295	300	
Glu	Ile	Gln	Glu	Val	Val	Thr	Glu	Lys	Thr	Gln	Ala	Gln	Glu	Leu	Glu	305	310	315	320
Val	Pro	Lys	Glu	Lys	Thr	Gln	Glu	Ser	Ala	Glu	Ala	Leu	Gln	Glu	Thr	325	330	335	
Gln	Ala	His	Glu	Leu	Glu	Lys	Gln	Glu	Ile	Ala	Glu	Thr	Pro	Gln	Asp	340	345	350	
Val	Glu	Ile	Pro	Gln	Ser	Gln	Asp	Lys	Glu	Val	Gln	Glu	Leu	Glu	Ile	355	360	365	
Pro	Lys	Glu	Glu	Thr	Gln	Glu	Asn	Thr	Glu	Thr	Pro	Gln	Asp	Val	Glu	370	375	380	
Thr	Pro	Gln	Glu	Lys	Glu	Thr	Gln	Glu	Asp	His	Tyr	Glu	Ser	Ile	Glu	385	390	395	400
Asp	Ile	Pro	Glu	Pro	Val	Met	Ala	Lys	Ala	Met	Gly	Glu	Glu	Leu	Pro	405	410	415	
Phe	Leu	Asn	Glu	Ala	Val	Ala	Lys	Ile	Pro	Asn	Asn	Glu	Asn	Asp	Thr	420	425	430	

Glu Thr Pro Lys Glu Ser Val Thr Glu Thr Ser Lys Asn Glu Asn Asn  
435 440 445

Thr Glu Thr Pro Gln Glu Lys Glu Glu Ser Asp Lys Thr Ser Ser Pro  
450 455 460

Leu Glu Leu Arg Leu Asn Leu Gln Asp Leu Leu Lys Ser Leu Asn Gln  
465 470 475 480

Glu Ser Leu Lys Ser Leu Leu Glu Asn Lys Thr Leu Ser Ile Lys Ile  
485 490 495

Thr Leu Glu Asp Lys Lys Pro Asn Ala  
500 505

<210> 13  
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<212> PRT  
<213> H. pylori

<220>  
<221> misc\_feature  
<223> histidine-rich, metal binding polypeptide (hpn)

<220>  
<221> misc\_feature  
<223> gi|2314604

<400> 13

Met Ala His His Glu Glu Gln His Gly Gly His His His His His His  
1 5 10 15

His Thr His His His His Tyr His Gly Gly Glu His His His His His  
20 25 30

His Ser Ser His His Glu Glu Gly Cys Cys Ser Thr Ser Asp Ser His  
35 40 45

His Gln Glu Glu Gly Cys Cys His Gly His His Glu  
50 55 60

<210> 14  
<211> 72  
<212> PRT  
<213> H. pylori

<220>  
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<223> histidine and glutamine-rich protein

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<221> misc\_feature  
<223> gi|2314605

<400> 14

Met Ala His His Glu Gln Gln Gln Gln Gln Ala Asn Ser Gln His  
1 5 10 15  
His His His His His Ala His His His His Tyr Tyr Gly Gly Glu His  
20 25 30  
His His His Asn Ala Gln Gln His Ala Glu Gln Gln Ala Glu Gln Gln  
35 40 45  
Ala Gln Gln Gln Gln Gln Gln Gln Ala His Gln Gln Gln Gln Gln Lys  
50 55 60  
Ala Gln Gln Gln Asn Gln Gln Tyr  
65 70

<210> 15  
<211> 1139  
<212> PRT  
<213> M. genitalium

<220>  
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<223> cytodherence-accessory protein

<220>  
<221> misc\_feature  
<223> gi|1046012

<400> 15

Met Ala Lys Asn Lys Gln Ser Val Phe Glu Glu Lys Asn Tyr Thr Gln  
1 5 10 15  
Thr Glu Pro Glu Asn Ile Phe Gly Asp Leu Tyr Asp Gly Lys Ser Thr  
20 25 30  
Val Glu Glu Asp Pro Asn Ile Lys Val Ala Tyr Asp Ala Asp Gly Asn  
35 40 45  
Gly Tyr Tyr Ile Ala Phe Asn Lys Glu Thr Gly Val Tyr Tyr Asp Pro  
50 55 60  
Tyr Gly Asp Thr Glu Tyr Asp Ile Ser Gln Leu Phe Asp Glu Asn Gly  
65 70 75 80  
Asn Pro Phe Val Phe Asp Glu Lys Gln Glu Glu Asn Asp Tyr Leu Lys  
85 90 95





	675					680					685				
Val	Val 690	Glu	Thr	Ser	Asn	Tyr 695	Thr	Asn	Asn	Leu	Gln 700	Lys	Phe	Asp	Ile
Gln 705	Ser	Asp	Asn	Lys	Ile 710	Thr	Ile	Thr	Thr	Lys 715	Lys	Ser	Ser	Pro	Gln 720
Ile	Pro	Thr	Thr	Leu 725	Pro	Ile	Ser	Phe	Val 730	Ser	Asn	Arg	Ile	Glu 735	Tyr
Lys	Pro	Val	Glu 740	Thr	Leu	Ala	Leu	Asp 745	Asn	Lys	Glu	Ser	Gln 750	Gln	Glu
Gln	Ile	Thr 755	Ile	Asn	Ser	Ile	Thr 760	Glu	Asp	Ser	Lys 765	Thr	Leu	Ala	Lys
Thr 770	Leu	Ser	Val	Gln	Leu 775	Gln	Gln	Ile	Asn	Ser	Leu 780	Asn	Asn	Gln	Ser
Ile 785	Val	Thr	Ser	Glu 790	Ser	Val	Arg	Leu	Asp 795	Lys	Lys	Asp	Asp	Gln	Leu 800
Thr	Ile	Asn	Thr	Val 805	Asn	Ser	Glu	Asp	Gln 810	Gln	Pro	Lys	Ile	Glu 815	Val
Phe	Val	Lys	Ala 820	Lys	Glu	Pro	Val	Glu 825	Glu	His	Ser	Ile	Thr 830	Gln	Asn
Lys	Gln	Ser 835	Val	Glu	Asp	Lys	Ser 840	Glu	Leu	Asp	Asn	Phe 845	Asn	Lys	Lys
Ser 850	Asp	Leu	Tyr	Lys	Ile 855	Ile	Ser	Glu	Leu	Lys	Arg 860	Gly	Glu	Leu	Asn
Pro 865	Thr	Ile	Asn	Phe 870	Asp	Ala	Ile	Phe	Gln	Met 875	Asn	Asp	Tyr	Gln	Met 880
Ser	Val	Lys	Gln	Ser 885	Phe	Ile	His	Leu	Asn 890	Asp	Phe	Val	Thr	Asn 895	Tyr
Lys	Asn	Gln 900	Ile	Ser	Glu	Arg	Tyr	Leu 905	Ile	Ile	Lys	Lys	Glu 910	Leu	Gln
Ser	Glu 915	Leu	Ser	Arg	Leu	Ile	Asp 920	Gln	Asn	Glu	Asn	Leu 925	Asn	Val	Gln
Phe 930	Asn	Asn	Ala	Lys	Asn 935	Leu	Thr	Thr	Leu	Gln	Lys 940	Glu	Glu	Met	Ile
Arg 945	Ser	Leu	Ala	Ser 950	Asp	Phe	Ala	Ile	Ala	Tyr 955	Lys	Pro	Ser	Asn	Ser 960
Tyr	Glu	Gln	Leu	Gln 965	Lys	Ser	Gly	Glu	Ile 970	Met	Arg	His	Val	Gln 975	Arg





20					25					30					
Pro	Lys	Lys	Glu	Gln	Asp	Lys	Val	Glu	Asn	Leu	Phe	Asp	Gln	Pro	Phe
	35						40					45			
Leu	Gly	Glu	Ile	Lys	Lys	Asn	Ile	Leu	Lys	Lys	Thr	Lys	Ser	Phe	Asn
	50					55					60				
Ser	Lys	Lys	Lys	Glu	Thr	Val	Lys	Ser	Lys	Ser	Lys	Ser	Pro	Ile	Asp
65						70					75				80
Phe	Phe	Asp	Glu	Thr	Lys	Arg	Gly	Val	Phe	Ile	Val	Pro	Pro	Glu	Thr
				85					90					95	
Asp	Ile	Leu	Ser	Arg	Arg	Glu	Leu	Asn	Gln	Lys	Thr	Val	Val	Asn	Thr
			100					105					110		
Val	Pro	Asn	Gln	Thr	Ser	Ser	Tyr	Pro	Thr	Ile	Asn	Glu	Asn	Lys	Leu
		115					120					125			
Val	Glu	Leu	Asn	Asn	Gln	Pro	Glu	Thr	Lys	Val	Leu	Glu	Thr	Lys	Lys
	130					135					140				
Asp	Ser	Phe	Thr	Thr	Thr	Ile	Arg	Glu	Lys	Lys	Leu	Asn	Pro	Glu	Asp
145						150					155				160
Ser	Gln	Ala	Phe	Trp	Tyr	Ile	Phe	Val	Gly	Asp	Arg	Lys	Tyr	Gly	Phe
				165					170					175	
Trp	Lys	Asn	His	Thr	Trp	Val	Trp	Leu	Gly	Tyr	Phe	Asp	Gln	Leu	Gln
			180					185					190		
Arg	Trp	Asn	Tyr	Phe	Lys	Val	Ile	Glu	Thr	Val	Glu	Val	Pro	Gln	Glu
		195					200					205			
His	Ala	Ala	Phe	Ile	Lys	Gln	Arg	Pro	Ala	Asp	Ile	Asp	Phe	Trp	Arg
	210					215					220				
Pro	Leu	Val	Gly	Asn	Pro	Asn	Tyr	Gly	Phe	Val	Gln	Asn	Asn	Thr	Trp
225						230					235				240
Ile	Trp	Lys	Gly	Phe	Phe	Asp	Lys	Lys	Leu	Asn	Trp	Ile	Pro	Asp	Pro
				245					250					255	
Val	Arg	Phe	Thr	Glu	Glu	Ala	Leu	Gly	His	Thr	Asp	Ser	Leu	Val	Asp
			260					265					270		
Glu	Ile	Glu	Lys	Lys	Thr	Ile	Ser	Glu	Gln	Pro	Tyr	Trp	Glu	Gln	Glu
		275					280					285			
Asn	Asp	Ile	Val	Val	Thr	Val	Phe	Asn	Thr	Lys	Ser	Leu	Ala	Ser	Ser
	290					295					300				
Leu	Glu	Asn	Glu	Leu	Leu	Leu	Glu	Asn	Ser	Ser	Glu	Glu	Gln	Pro	Val
305						310					315				320

Ile	Glu	Glu	Val	Lys	Pro	Arg	Arg	Asn	Glu	Val	Ile	Phe	Arg	Asn	Pro	325	330	335	
Val	Thr	Lys	Leu	His	Phe	Glu	Lys	Glu	Lys	Phe	Glu	Phe	Leu	Asn	Pro	340	345	350	
Val	Lys	Glu	Thr	Asn	Glu	Thr	Ile	Pro	Leu	Ile	Glu	Ile	Val	Lys	Glu	355	360	365	
Glu	Val	Lys	Val	Glu	Ser	Glu	Val	Glu	Ala	Pro	Val	Glu	Ile	Glu	Pro	370	375	380	
Glu	Ala	Ala	Cys	Glu	Pro	Glu	Thr	Thr	Ile	Pro	Glu	Val	Glu	Thr	Val	385	390	395	400
Phe	Val	Tyr	Glu	Asp	Asp	Leu	Lys	Gly	Leu	Asp	Ser	Asn	Gln	Thr	Gln	405	410	415	
Ala	Gly	Asn	Val	Pro	Glu	Val	Glu	Thr	Val	Phe	Val	Tyr	Glu	Asp	Asp	420	425	430	
Leu	Lys	Gly	Leu	Asp	Ser	Ile	Ile	Lys	Asp	Asp	Gln	Gln	His	Asp	Glu	435	440	445	
Ile	Ala	Lys	His	Val	Glu	His	Leu	Ser	Gln	Asp	Tyr	Ser	Lys	Glu	Ile	450	455	460	
Lys	Asp	Ser	Ala	Lys	Ala	Asp	Leu	Ser	Asn	Ile	Ser	Asp	Asp	Ile	Asp	465	470	475	480
Ser	Val	Trp	Lys	Glu	Phe	Gly	Ser	Phe	Thr	Asp	Glu	Thr	Gln	Lys	Ser	485	490	495	
Val	Glu	Glu	Lys	Ser	Gln	Val	Asp	Glu	Ile	Ile	Leu	Asp	Ala	Asn	Asn	500	505	510	
Asp	Phe	Ile	Asn	Glu	Ser	Leu	Phe	Arg	Asp	Glu	Val	Val	Asn	Asn	Ile	515	520	525	
Asp	Ser	Gln	Ile	Asn	Glu	Thr	Val	Ser	Glu	Gln	Gln	Phe	Glu	Pro	Thr	530	535	540	
Tyr	Ser	Val	Asn	Glu	Phe	Gln	Gln	Glu	Phe	Ser	Glu	Pro	Val	Val	Ser	545	550	555	560
Asp	Glu	Lys	Ile	Lys	Glu	Thr	Asn	Ser	Asp	Glu	Ser	Val	Asn	Thr	Asp	565	570	575	
Leu	Thr	Ala	Leu	Phe	Ser	Glu	Lys	Leu	Val	Asn	Glu	Val	Leu	Leu	Thr	580	585	590	
Asn	Glu	Tyr	Val	Asp	Val	Asn	Ala	Pro	Phe	Ser	Thr	Glu	Thr	Glu	Val	595	600	605	

Lys Val Ser Ser Glu Leu Pro Lys Ser Glu Leu Val Asp Glu Ile Thr  
 610 615 620  
 Phe Ile Asn Asn Asp Pro Lys Pro Gln Glu Gly Leu Glu Tyr Lys Val  
 625 630 635 640  
 Asp Phe Leu Glu Thr Glu Pro Lys Ser Leu Phe Asp Glu Lys Thr Thr  
 645 650 655  
 Ile Val Val Glu Ser Glu Pro Pro Phe Ile Gln Pro Asp Leu Ser Leu  
 660 665 670  
 Glu Leu Asp Ser Val Asn Asp Val Asp Lys Ser Leu Glu Thr Lys Thr  
 675 680 685  
 Thr Ser Val Glu Leu Asn His Glu Glu Ile Gly Asn Glu Phe Ile Asn  
 690 695 700  
 Leu Asp Val Ser Glu Lys Glu Val Gln Glu Gln Pro Thr Thr Gln Leu  
 705 710 715 720  
 Glu Thr Asp Ser Glu Phe Val Leu Pro Thr Tyr Gln Ile Val Glu Asp  
 725 730 735  
 Ser Phe Thr Glu Ser Ala Glu Thr Pro Asn Glu Phe Ser Ser Glu Gln  
 740 745 750  
 Lys Asp Thr Leu Glu Phe Ile Ser Gln Thr Gln Glu Val Glu Thr Ser  
 755 760 765  
 Glu Ser Asn Val Pro Thr Val Glu Gln Glu Thr Lys Leu Phe Glu His  
 770 775 780  
 Gln Asp Glu Asn Asn Leu Phe Thr Pro Leu Pro Leu Asp Leu Thr Glu  
 785 790 795 800  
 Ile Ile Glu Ser Asn Ala Leu Phe Asp Ser Lys Pro Asp Glu Lys Glu  
 805 810 815  
 Ser Ser Asp Ser Glu Leu Gln Pro Thr Phe Lys Glu Ile Lys Leu Asp  
 820 825 830  
 Ser Thr Val Glu Val Pro Gln Glu Ser Ser Gln Val Glu Ala Thr Phe  
 835 840 845  
 Asp Thr Val Gln Pro Glu Ala Val Phe Asp Glu Ile Lys Thr Gln Glu  
 850 855 860  
 Leu Gln Pro Glu Ala Thr Thr Glu Val Val Phe Asp Asp His Phe Gln  
 865 870 875 880  
 Pro Asp Val Gln Pro Glu Gln Thr Pro Gln Glu Ala Lys Phe Asp Ser  
 885 890 895  
 Pro Val Glu Ile Pro Gln Glu Ser Ser Gln Ala Glu Phe His Ala Glu

900					905					910						
Gln	Ile	Ser	Asp	Glu	Ile	Lys	Leu	Glu	Glu	Lys	Thr	Glu	Ala	Val	Phe	
915					920					925						
Asp	His	Gln	Gln	Leu	Glu	Asn	Gln	Ser	Glu	Glu	Thr	Val	Val	Thr	Pro	
930					935					940						
Thr	Glu	Val	Thr	Ala	Phe	Glu	Pro	Glu	Thr	Ile	Glu	Thr	Gln	Leu	Glu	
945					950					955					960	
Pro	Ser	Ser	Glu	Asp	Gln	Pro	Ser	Glu	Pro	Ala	Leu	Asp	Gln	Asn	His	
965					970					975						
Pro	Glu	Ile	Val	Thr	Ala	Glu	Val	Glu	Gln	Ile	Phe	Asp	Gly	Thr	Lys	
980					985					990						
Leu	Glu	Asp	Leu	Lys	Leu	Glu	Glu	Ala	Asn	Phe	Asp	Asn	Val	Glu	Asn	
995					1000					1005						
Asn	Glu	Val	Gln	Pro	Lys	Glu	Thr	Glu	Ala	Glu	Ile	Thr	Phe	Asp		
1010					1015					1020						
Glu	Thr	Lys	Glu	Leu	Gln	Gln	Glu	Thr	Ser	Ser	Glu	Pro	Leu	Ser		
1025					1030					1035						
Thr	Glu	Glu	Leu	Lys	Ser	Glu	Ala	Thr	Phe	Asp	Asn	Val	Ser	Glu		
1040					1045					1050						
Ala	Glu	Ser	Glu	Ala	Val	Phe	Glu	Lys	Pro	Gln	Leu	Glu	Thr	Gln		
1055					1060					1065						
Thr	Glu	Lys	Ile	Leu	Glu	Glu	Glu	Pro	Lys	Ser	Glu	Pro	Val	Asp		
1070					1075					1080						
Gln	Leu	Ile	Thr	Glu	Ala	Ser	Phe	Asp	Thr	Val	Lys	His	Glu	Ala		
1085					1090					1095						
Val	Phe	Asp	Lys	Asn	Gln	Thr	Gln	Thr	Glu	Gly	Leu	Glu	Glu	Pro		
1100					1105					1110						
Gln	Val	Ser	Ser	Glu	Ala	Glu	Val	Val	Asp	Gln	Thr	Thr	Thr	Asp		
1115					1120					1125						
Thr	Val	Gly	Glu	Pro	Glu	Ala	Val	Phe	Asp	Val	Gln	Pro	Glu	Lys		
1130					1135					1140						
Thr	Thr	Glu	Val	Lys	Phe	Asp	Asp	Val	Glu	Asn	Gln	Gln	Lys	Val		
1145					1150					1155						
Ile	Ser	Glu	Pro	Gln	Val	Glu	Gln	Gln	Pro	Gly	Glu	Ala	Val	Phe		
1160					1165					1170						
Glu	Pro	Ser	Ala	Glu	Ala	Lys	Phe	Asp	Ser	Pro	Val	Glu	Ser	Val		
1175					1180					1185						



Gly	Phe	Phe	Gly	Asp	Asp	Gln	Lys	Trp	Asn	Lys	Asp	Ala	Thr	Val
1460						1465					1470			
Lys	Trp	Ala	Arg	Glu	Arg	Asp	Tyr	Leu	Pro	Leu	Ile	Gly	Asp	Glu
1475						1480					1485			
Val	Tyr	Gly	Arg	Tyr	Asn	Asn	Lys	Gly	Glu	Trp	Ile	Trp	Tyr	Gly
1490						1495					1500			
Phe	Tyr	Asp	Glu	Ser	Gly	Asp	Trp	Val	Leu	Val	Asp	Glu	Gln	Trp
1505						1510					1515			
Lys	Asn	Arg	Gln	Pro	Arg	Ile	Asn	Glu	Ala	Pro	Lys	Phe	Trp	Glu
1520						1525					1530			
Lys	Leu	Ile	Gly	Asn	Glu	Glu	Tyr	Gly	Tyr	Tyr	Glu	Asp	Asn	Glu
1535						1540					1545			
Trp	Asn	Trp	Tyr	Asp	Gly	Glu	Phe	Asp	Ser	Glu	Gly	Asn	Trp	Leu
1550						1555					1560			
Val	Phe	Gln	Ser	Glu	Glu	Thr	Glu	Asn	Leu	Asn	Glu	Asp	Ile	Thr
1565						1570					1575			
Lys	Asp	Ile	Pro	Ala	Leu	Glu	Gly	Tyr	Asp	Ile	Asp	Ser	Ile	Asp
1580						1585					1590			
Ala	Asp	Glu	Trp	Leu	Ser	Gln	Phe	Ser	Ala	Asp	Asp	Ala	Lys	Asp
1595						1600					1605			
Val	Phe	Gly	Ser	Asn	Asp	Lys	Lys							
1610						1615								

<210> 17  
 <211> 274  
 <212> PRT  
 <213> M. pneumoniae

<220>  
 <221> misc\_feature  
 <223> 30K adhesin-related protein

<220>  
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 <223> gi|1674069

<400> 17

Met	Lys	Leu	Pro	Pro	Arg	Arg	Lys	Leu	Lys	Leu	Phe	Leu	Leu	Ala	Trp
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			20					25							30

Val	Gln	His	Asn	Asn	Thr	Glu	Leu	Thr	Glu	Val	Lys	Ser	Glu	Leu	Ser
		35					40					45			
Pro	Leu	Asn	Val	Val	Leu	His	Ala	Glu	Glu	Asp	Thr	Val	Gln	Ile	Gln
	50					55					60				
Gly	Lys	Pro	Ile	Thr	Glu	Gln	Ala	Trp	Phe	Ile	Pro	Thr	Val	Ala	Gly
65					70					75					80
Cys	Phe	Gly	Phe	Ser	Ala	Leu	Ala	Ile	Ile	Leu	Gly	Leu	Ala	Ile	Gly
				85					90					95	
Leu	Pro	Ile	Val	Lys	Arg	Lys	Glu	Lys	Arg	Leu	Leu	Glu	Glu	Lys	Glu
			100					105						110	
Arg	Gln	Glu	Gln	Leu	Ala	Glu	Gln	Leu	Gln	Arg	Ile	Ser	Ala	Gln	Gln
		115					120					125			
Glu	Glu	Gln	Gln	Ala	Leu	Glu	Gln	Gln	Ala	Ala	Ala	Glu	Ala	His	Ala
	130					135						140			
Glu	Ala	Glu	Val	Glu	Pro	Ala	Pro	Gln	Pro	Val	Pro	Val	Pro	Pro	Gln
145					150					155					160
Pro	Gln	Val	Gln	Ile	Asn	Phe	Gly	Pro	Arg	Thr	Gly	Phe	Pro	Pro	Gln
				165					170					175	
Pro	Gly	Met	Ala	Pro	Arg	Pro	Gly	Met	Pro	Pro	His	Pro	Gly	Met	Ala
			180					185					190		
Pro	Arg	Pro	Gly	Phe	Pro	Pro	Gln	Pro	Gly	Met	Ala	Pro	Arg	Pro	Gly
		195					200					205			
Met	Pro	Pro	His	Pro	Gly	Met	Ala	Pro	Arg	Pro	Gly	Phe	Pro	Pro	Gln
	210					215					220				
Pro	Gly	Met	Ala	Pro	Arg	Pro	Gly	Met	Pro	Pro	His	Pro	Gly	Met	Ala
225					230					235					240
Pro	Arg	Pro	Gly	Phe	Pro	Pro	Gln	Pro	Gly	Met	Ala	Pro	Arg	Pro	Gly
			245						250					255	
Met	Gln	Pro	Pro	Arg	Pro	Gly	Met	Pro	Pro	Gln	Pro	Gly	Phe	Pro	Pro
		260						265					270		

Lys Arg

<210> 18  
 <211> 256  
 <212> PRT  
 <213> M. tuberculosis  
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<221> misc\_feature  
<223> PE\_PGRS

<220>  
<221> misc\_feature  
<223> gi|3261822

<400> 18

Met Ile Gly Asp Gly Ala Asn Gly Gly Pro Gly Gln Pro Gly Gly Pro  
1 5 10 15  
Gly Gly Leu Leu Tyr Gly Asn Gly Gly His Gly Gly Ala Gly Ala Ala  
20 25 30  
Gly Gln Asp Arg Gly Ala Gly Asn Ser Ala Gly Leu Ile Gly Asn Gly  
35 40 45  
Gly Ala Gly Gly Ala Gly Gly Asn Gly Gly Ile Gly Gly Ala Gly Ala  
50 55 60  
Pro Gly Gly Leu Gly Gly Asp Gly Gly Lys Gly Gly Phe Ala Asp Glu  
65 70 75 80  
Phe Thr Gly Gly Phe Ala Gln Gly Gly Arg Gly Gly Phe Gly Gly Asn  
85 90 95  
Gly Asn Thr Gly Ala Ser Gly Gly Met Gly Gly Ala Gly Gly Ala Gly  
100 105 110  
Gly Ala Gly Gly Ala Gly Gly Leu Leu Ile Gly Asp Gly Gly Ala Gly  
115 120 125  
Gly Ala Gly Gly Ile Gly Gly Ala Gly Gly Val Gly Gly Gly Gly Gly  
130 135 140  
Ala Gly Gly Thr Gly Gly Gly Gly Val Ala Ser Ala Phe Gly Gly Gly  
145 150 155 160  
Asn Ala Phe Gly Gly Arg Gly Gly Asp Gly Gly Asp Gly Gly Asp Gly  
165 170 175  
Gly Thr Gly Gly Ala Gly Gly Ala Arg Gly Ala Gly Gly Ala Gly Gly  
180 185 190  
Ala Gly Gly Trp Leu Ser Gly His Ser Gly Ala His Gly Ala Met Gly  
195 200 205  
Ser Gly Gly Glu Gly Gly Ala Gly Gly Gly Gly Gly Ala Arg Gly Glu  
210 215 220  
Ala Gly Ala Gly Gly Gly Thr Ser Thr Gly Thr Asn Pro Gly Lys Ala  
225 230 235 240



Gly Ala Pro Gly Thr Gln Gly Asp Ser Gly Asp Pro Gly Pro Pro Gly  
 245 250 255

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 <212> PRT  
 <213> M. tuberculosis

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 <223> PE\_PGRS

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<400> 19

Ala Gln Ala Ser Pro Ala Ala His Gly Gly Ser Gly Gly Ala Gly Gly  
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 Asn Gly Gly Ala Gly Ser Ala Gly Asn Gly Gly Ala Gly Gly Ala Gly  
 20 25 30  
 Gly Asn Gly Gly Ala Gly Gly Asn Gly Gly Gly Gly Asp Ala Gly Asn  
 35 40 45  
 Ala Gly Ser Gly Gly Asn Gly Gly Lys Gly Gly Asp Gly Val Gly Pro  
 50 55 60  
 Gly Ser Thr Gly Gly Ala Gly Gly Lys Gly Gly Ala Gly Ala Asn Gly  
 65 70 75 80  
 Gly Ser Ser Asn Gly Asn Ala Arg Gly Gly Asn Ala Gly Asn Gly Gly  
 85 90 95  
 His Gly Gly Ala Gly Gly Ser Gly Asp Thr Gly Gly Ala Gly Gly Ala  
 100 105 110  
 Gly Gly Gln Gly Gly Phe Gly Gly Thr Gly Gly Ser Gly Ser Gly Ile  
 115 120 125  
 Gly Gly Gly Ala Gly Gly Asn Gly Gly Asn Gly Gly Ala Gly Gly Thr  
 130 135 140  
 Gly Val Val Leu Gly Gly Lys Gly Gly Asp Gly Gly Asn Gly Asp His  
 145 150 155 160  
 Gly Gly Pro Ala Thr Asn Pro Gly Ser Gly Ser Arg Gly Gly Ala Gly  
 165 170 175  
 Gly Ser Gly Gly Asn Gly Gly Ala Gly Gly Asn Ala Thr Gly Ser Gly

Gly	Lys	Gly	Gly	Ala	Gly	Gly	Asn	Gly	Gly	Asp	Gly	Ser	Phe	Gly	Ala
	195						200					205			
Thr	Ser	Gly	Pro	Ala	Ser	Ile	Gly	Val	Thr	Gly	Ala	Pro	Gly	Gly	Asn
	210					215					220				
Gly	Gly	Lys	Gly	Gly	Ala	Gly	Gly	Ser	Asn	Pro	Asn	Gly	Ser	Gly	Gly
225					230					235					240
Asp	Gly	Gly	Lys	Gly	Gly	Asn	Gly	Gly	Ala	Gly	Gly	Asn	Gly	Gly	Ser
				245					250						255
Ile	Gly	Ala	Asn	Ser	Gly	Ile	Val	Gly	Gly	Ser	Gly	Gly	Ala	Gly	Gly
			260					265						270	
Ala	Gly	Gly	Ala	Gly	Gly	Asn	Gly	Ser	Leu	Ser	Ser	Gly	Glu	Gly	Gly
		275					280					285			
Lys	Gly	Gly	Asp	Gly	Gly	His	Gly	Gly	Asp	Gly	Val	Gly	Gly	Asn	Ser
	290					295					300				
Ser	Val	Thr	Gln	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Gly	Ala	Gly	Gly	Ala
305					310					315					320
Gly	Gly	Ser	Gly	Phe	Phe	Gly	Gly	Lys	Gly	Gly	Phe	Gly	Gly	Asp	Gly
				325					330					335	
Gly	Gln	Gly	Gly	Pro	Asn	Gly	Gly	Gly	Thr	Val	Gly	Thr	Val	Ala	Gly
			340					345						350	
Gly	Gly	Gly	Asn	Gly	Gly	Val	Gly	Gly	Arg	Gly	Gly	Asp	Gly	Val	Phe
		355					360					365			
Ala	Gly	Ala	Gly	Gly	Gln	Gly	Gly	Leu	Gly	Gly	Gln	Gly	Gly	Asn	Gly
	370					375					380				
Gly	Gly	Ser	Thr	Gly	Gly	Asn	Gly	Gly	Leu	Gly	Gly	Ala	Gly	Gly	Gly
385					390				395						400
Gly	Gly	Asn	Ala	Pro	Asp	Gly	Gly	Phe	Gly	Gly	Asn	Gly	Gly	Lys	Gly
				405				410						415	
Gly	Gln	Gly	Gly	Ile	Gly	Gly	Gly	Thr	Gln	Ser	Ala	Thr	Gly	Leu	Gly
			420					425					430		
Gly	Asp	Gly	Gly	Asp	Gly	Gly	Asp	Gly	Gly	Asn	Gly	Gly	Asn	Ser	Gly
	435						440					445			
Ala	Lys	Ala	Gly	Gly	Ala	Gly	Gly	Lys	Gly	Gln	Ala	Gly	Gln	Pro	Asn
	450					455					460				
Ser	Gly	Thr	Glu	Pro	Gly	Phe	Gly	Gly	Asp	Gly	Gly	Leu	Gly	Gly	Ala
465					470				475						480

Gly Ala Thr Pro

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35 40 45  
Gly Thr Gly Gly Ala Ala Gly Thr Gly Thr Gly Gly Gln Gln Gly Asn  
50 55 60  
Gly Gly Asn Gly Gly Asn Gly Gly Thr Gly Gly Lys Gly Gly Thr Gly  
65 70 75 80  
Gly Asp Gly Ala Leu Ala Gly Ser Ser Gly Gly Ala Gly Gly Lys Gly  
85 90 95  
Gly Asn Gly Gly Asp Ala Gly Lys Ala Gly Thr Gly Ser Ala Pro Gly  
100 105 110  
Thr Ala Gly Thr Gly Gly Asp Gly Gly Lys Gly Gly Asn Gly Gly Ile  
115 120 125  
Gly Ala Ala Gly Thr Thr Gly Pro Val Gly Thr Gly Ala Ser Gly Gly  
130 135 140  
Thr Gly Gly Ser Gly Gly Ala Gly Gly Thr Gly Gly Asp Gly Gly Ala  
145 150 155 160  
Ala Asn Gly Gly Thr Ala Gly Ala Gly Gly Ala Gly Gly Asn Gly Gly  
165 170 175  
Lys Gly Gly Asp Gly Gly Ala Gly Val Thr Ser Ser Thr Ala Gly Asn

Ser	Gly	Gly	Ala	Gly	Gly	Ser	Gly	Gly	Lys	Gly	Gly	Asp	Ala	Gly	Ala
		195					200					205			
Gly	Gly	Ala	Gly	Ala	Thr	Pro	Gly	Ala	Asn	Gly	Ile	Ala	Gly	Asn	Gly
		210				215					220				
Gly	Asp	Gly	Gly	Asp	Gly	Ala	Ala	Gly	Ala	Val	Gly	Ile	Ser	Gly	Ala
225					230					235					240
Thr	Gly	Ala	Gly	Asp	Gly	Gly	His	Gly	Gly	Thr	Gly	Ala	Ala	Gly	Gly
				245						250					255
Asn	Gly	Gly	Thr	Gly	Gly	Ala	Gly	Gly	Ser	Gly	Ile	Asp	Gly	Val	Gly
			260						265					270	
Gly	Gly	Thr	Gly	Gly	Thr	Gly	Gly	Asn	Gly	Gly	Asn	Gly	Ala	Ile	Gly
		275						280				285			
Gly	Ala	Gly	Gly	Asp	Ala	Gly	Gly	Ser	Gly	Asn	Ser	Gly	Gly	Asn	Gly
		290				295					300				
Gly	Ile	Gly	Gly	Lys	Gly	Gly	Asn	Ala	Gly	Ala	Gly	Gly	Ala	Ala	Gly
305					310					315					320
Ser	Asn	Gly	Gly	Thr	Val	Gly	Ala	Asn	Gly	Thr	Gly	Gly	Asp	Gly	Gly
				325					330					335	
Asn	Gly	Gly	Ala	Ala	Gly	Ala	Ala	Thr	Ala	Gly	Ser	Asn	Gly	Gly	Ala
			340					345					350		
Gly	Thr	Gly	Ser	Ala	Gly	Gly	Asn	Gly	Gly	Thr	Gly	Gly	Arg	Gly	Gly
		355					360					365			
Ser	Gly	Gly	Ala	Gly	Gly	Asp	Gly	Ile	Gly	Gly	Val	Gly	Gly	Gly	Lys
		370				375					380				
Gly	Gly	Asn	Gly	Ala	Asp	Gly	Glu	Val	Gly	Gly	Ala	Gly	Gly	Ala	Gly
385					390					395					400
Gly	Ser	Gly	Pro	Asn	Thr	Ser	Pro	Gly	Gly	Asn	Gly	Gly	Gln	Gly	Gly
				405					410					415	
Gln	Gly	Gly	Ser	Gly	Gly	Ala	Gly	Gly	Ala	Ala	Gly	Ala	Gly	Gly	Ala
			420					425					430		
Gly	Gly	Gly	Ala	Asn	Gly	Thr	Ala	Gly	Asn	Gly	Gly	Gln	Gly	Gly	Ala
		435					440					445			
Gly	Gly	Thr	Gly	Gly	Ala	Gly	Ala	Ala	Ser	Ser	Ala	Thr	Asn	Gly	Gly
		450				455					460				
Ser	Gly	Gly	Ala	Gly	Gly	Thr	Gly	Gly	Asp	Gly	Gly	Ser	Gly	Gly	Ala
465					470				475						480

Gly	Gly	Thr	Gly	Gly	Ala	Gly	Gly	Thr	Gly	Gly	Ala	Ala	Gly	Asp	Gly
				485					490					495	
Gly	Gln	Gly	Gly	Gln	Gly	Gly	Ala	Gly	Gly	Gly	Ala	Gly	Gly	Gln	Gly
			500					505					510		
Gly	Ala	Gly	Gly	Ala	Gly	Gly	Thr	Gly	Gly	Asn	Gly	Gly	Asn	Ile	Thr
		515					520					525			
Gly	Gly	Thr	Ala	Gly	Thr	Ala	Gly	Ala	Ala	Gly	Asn	Gly	Gly	Ala	Ala
	530					535					540				
Gly	Lys	Gly	Gly	Ala	Gly	Gly	Gln	Gly	Gly	Thr	Gly	Gly	Gly	Thr	Gly
545				550						555					560
Gly	Gln	Gly	Gly	Ala	Gly	Gly	Asp	Gly	Gly	Ala	Gly	Gly	Thr	Gly	Gly
			565					570					575		
Asp	Arg	Thr	Val	Gly	Gly	Gly	Thr	Val	Pro	Ala	Gly	Ser	Gly	Gly	Gln
		580					585					590			
Gly	Gly	Asn	Ala	Gly	Gly	Gly	Gly	Ala	Gly	Gly	Gln	Gly	Gly	Ala	Asp
		595					600					605			
Gly	Gly	Ser	Gly	Gly	Asp	Gly	Gly	Asp	Ala	Gly	Thr	Gly	Gly	Asn	Gly
	610					615					620				
Gly	Asn	Gly	Gly	Asn	Arg	Asn	Ser	Gly	Asn	Gly	Thr	Gly	Gly	Ala	Gly
625				630						635					640
Gly	Asn	Gly	Gly	Gly	Gly	Ala	Asn	Gly	Gly	Ala	Gly	Gly	Ala	Gly	Gly
			645						650					655	
Ser	Gly	Gly	Gly	Thr	Gly	Gly	Asn	Gly	Gly	Ala	Gly	Gly	Asp	Ala	Gly
		660					665						670		
Asp	Ala	Gly	Asn	Gly	Gly	Asn	Gly	Asn	Gly	Thr	Gly	Asn	Gly	Gly	Asn
	675						680					685			
Gly	Gly	Asn	Gly	Gly	Ile	Ala	Gly	Met	Gly	Gly	Asn	Gly	Gly	Ala	Gly
	690					695					700				
Thr	Gly	Ser	Gly	Asn	Gly	Gly	Asn	Gly	Gly	Ser	Gly	Gly	Asn	Gly	Gly
705				710						715					720
Asn	Ala	Gly	Met	Gly	Gly	Asn	Ser	Gly	Thr	Gly	Ser	Gly	Asp	Gly	Gly
			725						730					735	
Ala	Gly	Gly	Asn	Gly	Gly	Ala	Ala	Gly	Thr	Gly	Gly	Thr	Gly	Gly	Asp
		740						745					750		
Gly	Gly	Leu	Thr	Gly	Thr	Gly	Gly	Thr	Gly	Gly	Ser	Gly	Gly	Thr	Gly
	755						760					765			

Gly Asp Gly Gly Asn Gly Gly Asn Gly Ala Asp Asn Thr Ala Asn Met  
770 775 780

Thr Ala Gln Ala Gly Gly Asp Gly Gly Asn Gly Gly Asp Gly Gly Phe  
785 790 795 800

Gly Gly Gly Ala Gly Ala Gly Gly Gly Gly Leu Thr Ala Gly Ala Asn  
805 810 815

Gly Thr Gly Gly Gln Gly Gly Ala Gly Gly Asp Gly Gly Asn Gly Ala  
820 825 830

Ile Gly Gly His Gly Pro Leu Thr Asp Asp Pro Gly Gly Asn Gly Gly  
835 840 845

Thr Gly Gly Asn Gly Gly Thr Gly Gly Thr Gly Gly Ala Gly Ile Gly  
850 855 860

Ser Leu Gly Gly Gly Thr Gly Gly Asp Gly Gly Asn Gly Gly Asn Gly  
865 870 875 880

Gly Thr Gly Gly Glu Gly Gly Glu Val Gly Gly Ala Gly Gly Thr Gly  
885 890 895

Gly Ala Ala Gly Asn Gly Gly Asp Gly Gly Thr Gly Gly Thr Gly Gly  
900 905 910

Gly Asp Gly Gly Ala Gly Gly Thr Gly Gly Thr Gly Gly Thr Gly Gly  
915 920 925

Leu Gly Asp Pro Arg Val Gly Gly Ser Gly Gly Asp Gly Gly Thr Gly  
930 935 940

Gly Ser Gly Gly Ala Ala Gly Asn Gly Gly Asn Gly Gly Asn Ala Gly  
945 950 955 960

Ala Gly Gly Asn Gly Asn Gly Gly Thr Gly Gly Ala Gly Gly Ile Gly  
965 970 975

Gly Thr Gly Gly Asn Gly Gly Asp Ala Glu Pro Gly Val Pro Pro Gly  
980 985 990

Ala Gly Gly Ala Gly Gly Ala Gly Thr Thr Gly Gly Lys Gly Gly Thr  
995 1000 1005

Gly Gly Asn Gly Ser Gly Thr Gly Ser Gly Gly Thr Gly Gly Asp  
1010 1015 1020

Gly Gly Thr Gly Gly Gly Gly Gly Asn Gly Gly Thr Gly Trp Asn  
1025 1030 1035

Gly Gly Lys Gly Asp Thr Gly Ser Gly Gly Gly Ala Gly Asp Gly  
1040 1045 1050

Gly Lys Ala Pro Ala Gly Gly Thr Gly Gly Ala Gly Gly Asp Gly

1055

1060

1065

Gly Ala Gly Gly Lys Gly Gly Ser Gly Gly Val  
1070 1075

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Met Pro Gly Arg Phe Arg Asn Phe Gly Ser Gln Asn Leu Gly Ser Gly  
1 5 10 15

Asn Ile Gly Ser Thr Asn Val Gly Ser Gly Asn Ile Gly Ser Thr Asn  
20 25 30

Val Gly Ser Gly Asn Ile Gly Asp Thr Asn Phe Gly Asn Gly Asn Asn  
35 40 45

Gly Asn Phe Asn Phe Gly Ser Gly Asn Thr Gly Ser Asn Asn Ile Gly  
50 55 60

Phe Gly Asn Thr Gly Ser Gly Asn Phe Gly Phe Gly Asn Thr Gly Asn  
65 70 75 80

Asn Asn Ile Gly Ile Gly Leu Thr Gly Asp Gly Gln Ile Gly Ile Gly  
85 90 95

Gly Leu Asn Ser Gly Ser Gly Asn Ile Gly Phe Gly Asn Ser Gly Thr  
100 105 110

Gly Asn Val Gly Leu Phe Asn Ser Gly Thr Gly Asn Val Gly Phe Gly  
115 120 125

Asn Ser Gly Thr Ala Asn Thr Gly Phe Gly Asn Ala Gly Asn Val Asn  
130 135 140

Thr Gly Phe Trp Asn Gly Gly Ser Thr Asn Thr Gly Leu Ala Asn Ala  
145 150 155 160

Gly Ala Gly Asn Thr Gly Phe Phe Asp Ala Gly Asn Tyr Asn Phe Gly  
165 170 175

Ser Leu Asn Ala Gly Asn Ile Asn Ser Ser Phe Gly Asn Ser Gly Asp  
 180 185 190  
 Gly Asn Ser Gly Phe Leu Asn Ala Gly Asp Val Asn Ser Gly Val Gly  
 195 200 205  
 Asn Ala Gly Asp Val Asn Thr Gly Leu Gly Asn Ser Gly Asn Ile Asn  
 210 215 220  
 Thr Gly Gly Phe Asn Pro Gly Thr Leu Asn Thr Gly Phe Phe Ser Ala  
 225 230 235 240  
 Met Thr Gln Ala Gly Pro Asn Ser Gly Phe Phe Asn Ala Gly Thr Gly  
 245 250 255  
 Asn Ser Gly Phe Gly His Asn Asp Pro Ala Gly Ser Gly Asn Ser Gly  
 260 265 270  
 Ile Gln Asn Ser Gly Phe Gly Asn Ser Gly Tyr Val Asn Thr Ser Thr  
 275 280 285  
 Thr Ser Met Phe Gly Gly Asn Ser Gly Val Leu Asn Thr Gly Tyr Gly  
 290 295 300  
 Asn Ser Gly Phe Tyr Asn Ala Ala Val Asn Asn Thr Gly Ile Phe Val  
 305 310 315 320  
 Thr Gly Val Met Ser Ser Gly Phe Phe Asn Phe Gly Thr Gly Asn Ser  
 325 330 335  
 Gly Leu Leu Val Ser Gly Asn Gly Leu Ser Gly Phe Phe Lys Asn Leu  
 340 345 350  
 Phe Gly

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 <213> Pseudomonas aeruginosa

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<400> 22

Met Thr Val Leu Asp Trp Leu Ser Leu Ala Leu Ala Thr Gly Leu Phe  
 1 5 10 15





180	185	190
Ala Lys Pro Ala Ala Lys Pro	Ala Ala Lys Thr Ala	Ala Ala Lys Pro
195	200	205
Ala Ala Lys Pro Ala Ala Lys Pro	Val Ala Lys Pro	Ala Ala Lys Pro
210	215	220
Ala Ala Lys Thr Ala Ala Ala Lys Pro	Ala Ala Lys Pro	Ala Ala Lys
225	230	235
Pro Val Ala Lys Pro Thr Ala Lys Pro	Ala Ala Lys Thr	Ala Ala Ala
245	250	255
Lys Pro Ala Ala Lys Pro Ala Ala Lys Pro	Ala Ala Lys Pro	Ala Ala
260	265	270
Lys Pro Val Ala Lys Ser Ala Ala Ala Lys Pro	Ala Ala Lys Pro	Ala Ala
275	280	285
Ala Lys Pro Ala Ala Lys Pro Ala Ala Lys Pro	Ala Ala Lys Pro	Ala Ala Lys Pro
290	295	300
Ala Ala Lys Pro Ala Ala Thr Lys Pro	Ala Thr Ala Pro	Ala Ala Lys
305	310	315
Pro Ala Ala Thr Pro Ser Ala Pro Ala Ala Ser	Ser Ser Ala Ala Ser	
325	330	335
Ala Thr Pro Ala Ala Gly Ser Asn Gly Ala Ala Pro	Thr Ser Ala Ser	
340	345	350

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 <212> PRT  
 <213> Pseudomonas aeruginosa  
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 <223> polyhydroxyalkanoate synthesis protein PhaF

<220>  
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 <223> gi|9951352

<400> 24

Met	Ala	Gly	Lys	Lys	Lys	Ser	Glu	Lys	Glu	Ser	Ser	Trp	Ile	Gly	Glu
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Ile	Glu	Lys	Tyr	Ser	Arg	Gln	Ile	Trp	Leu	Ala	Gly	Leu	Gly	Ala	Tyr
			20				25					30			

Ser Lys Val Ser Lys Asp Gly Ser Lys Leu Phe Glu Thr Leu Val Lys  
35 40 45

Asp Gly Glu Lys Ala Glu Lys Glu Ala Lys Ser Asp Val Asp Ala Gln  
50 55 60

Val Gly Ala Ala Lys Ala Ser Ala Arg Ser Ala Lys Ser Lys Val Asp  
65 70 75 80

Glu Val Arg Asp Arg Ala Leu Gly Lys Trp Ser Glu Leu Glu Glu Ala  
85 90 95

Phe Asp Lys Arg Leu Asn Ser Ala Ile Ser Arg Leu Gly Val Pro Ser  
100 105 110

Arg Asn Glu Val Lys Glu Leu His Ser Lys Val Asp Thr Leu Thr Lys  
115 120 125

Gln Ile Glu Lys Leu Thr Gly Val Ser Val Lys Pro Ala Ala Lys Ala  
130 135 140

Ala Ala Lys Pro Ala Ala Lys Pro Ala Ala Lys Pro Ala Ala Lys Thr  
145 150 155 160

Ala Ala Ala Lys Pro Ala Ala Lys Pro Ala Ala Lys Ala Ala Lys  
165 170 175

Pro Ala Ala Lys Pro Ala Ala Lys Lys Thr Ala Ala Lys Thr Ala Ala  
180 185 190

Ala Lys Pro Ala Ala Lys Pro Ala Ala Lys Pro Thr Ala Lys Ala Ala  
195 200 205

Ala Lys Pro Ala Thr Lys Pro Ala Ala Lys Ala Ala Ala Lys Pro Ala  
210 215 220

Ala Lys Pro Ala Ala Ala Lys Pro Ala Ala Lys Pro Ala Ala Lys Pro  
225 230 235 240

Ala Ala Ala Thr Ala Ala Lys Pro Ala Ala Lys Pro Ala Ala Lys Pro  
245 250 255

Ala Ala Lys Lys Pro Ala Ala Lys Lys Pro Ala Ala Lys Pro Ala Ala  
260 265 270

Ala Lys Pro Ala Ala Pro Ala Ala Ser Ser Ser Ala Pro Ala Ala Pro  
275 280 285

Ala Ala Thr Pro Ala Ala Ser Ala Pro Ala Ala Asn Ala Pro Ala Thr  
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Pro Ser Ser Gln Gly  
305

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 <223> dicarboxylate transporter (dctM)

<220>  
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 <223> gi|3323280

<400> 25

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Met Lys Gly Thr Arg Gly Gln Leu Val Leu Arg Ser Ile Ala Leu Leu
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Leu Ile Gly Thr Leu Met Leu Leu Pro Leu Val Leu Phe Leu Ile Glu
          20          25          30

Arg Ile Phe Gly Phe Leu Thr Arg Gly Val Gly Ser Glu Val Phe Ser
          35          40          45

Ala His Glu Asp Phe Ile Phe Leu Phe Phe Ser Ser Ser Asp Ala Ala
          50          55          60

Val Ala Gln Leu Ala Phe Val Phe Ser Cys Val Ala Gly Ile Tyr Ala
65          70          75          80

Ala Arg Glu Arg Lys His Leu Ser Val Thr Leu Phe Ser Cys Asp Val
          85          90          95

Asp Arg Pro Met His Arg Val Leu Ser Phe Leu Ser Ala Ile Cys Thr
          100          105          110

Val Ala Val Leu Ser Ala Cys Phe Phe Ala Ser Gly Pro Asn Ile Val
          115          120          125

Ala Val Phe Arg Lys Glu Glu Ala Val Trp Gly Val Pro Leu Arg Trp
          130          135          140

Ile Phe Thr Ala Leu Pro Cys Met Tyr Gly Ala Leu Leu Phe His Tyr
145          150          155          160

Ala Arg Glu Val Lys Cys Arg Thr Cys Val Ile Val Gly Leu Leu Val
          165          170          175

Gly Val Leu Ile Ser Thr Gly Ser Ile Ala Ser Val Leu Phe His Leu
          180          185          190

Phe Asp Leu Thr Val Pro Leu Leu Asp Ser Val Phe His Gly Trp Val
          195          200          205

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500	505	510
Ile Ala Phe Leu Gln His Ala	Ile Ser Ser Lys Tyr Ala	Phe Leu Leu
515	520	525
Leu Leu Asn Val Leu Leu Leu	Gly Val Gly Cys Ile Met Asp Leu Tyr	
530	535	540
Ser Ala Ile Leu Val Ile Ser Pro Leu Val Leu Pro Leu Ala Val His		
545	550	555 560
Phe Gly Val His Pro Val His Ala Ser Val Val Phe Leu Met Asn Leu		
	570	575
Glu Leu Gly Ala Leu Thr Pro Pro Ile Gly Met Asn Leu Phe Ile Ala		
	585	590
Ser Phe Ala Phe Glu Lys Pro Ile Val Tyr Leu Thr Arg Ala Ile Ala		
	600	605
Pro Phe Leu Leu Ala Gln Leu Gly Val Leu Leu Leu Thr Thr Tyr Ile		
610	615	620
Pro Trp Leu Ser Thr Ala Phe Leu		
625	630	
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<223> iron(III) ABC transporter, permease protein		
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<223> gi 9654609		
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Ala Leu Val Ser Leu Gln Trp Gly His Asn Leu Thr Leu Asn Glu Gln		
20	25	30
Trp Gln Leu Val Leu Gly His Gln Ala Ala Gln Ser Phe Ala Gln Val		
35	40	45
Asn Phe Ile Tyr Ala Gln Leu Pro Arg Ala Val Met Ala Ile Val Val		
50	55	60



355						360						365					
Ala	Ser	Trp	Ala	Leu	Pro	Ser	Glu	Phe	Gln	Trp	Pro	Leu	Arg	Trp	Pro		
370						375					380						
Arg	Met	Leu	Thr	Ala	Leu	Phe	Ala	Gly	Val	Gly	Leu	Ala	Ile	Ala	Gly		
385					390					395					400		
Thr	Leu	Leu	Gln	Arg	Leu	Ile	Tyr	Asn	Pro	Leu	Ala	Ser	Pro	Asp	Ile		
				405					410					415			
Leu	Gly	Val	Ser	Ser	Gly	Ala	Thr	Phe	Ala	Leu	Val	Phe	Ala	Ser	Leu		
			420					425					430				
Phe	Leu	Gly	Gln	Ser	Leu	Gln	Ser	Thr	His	Trp	Met	Thr	Ala	Leu	Leu		
435						440						445					
Gly	Ser	Ala	Ala	Val	Leu	Val	Ala	Leu	Leu	Leu	Leu	Gly	Arg	Arg	His		
450						455					460						
His	Tyr	Ala	Pro	Ser	Ser	Leu	Ile	Leu	Thr	Gly	Ile	Ala	Ile	Thr	Ala		
465					470					475					480		
Leu	Leu	Glu	Ala	Leu	Val	Gln	Phe	Thr	Leu	Ala	Lys	Gly	Thr	Gly	Asp		
				485					490					495			
Ser	Tyr	Gln	Ile	Leu	Leu	Trp	Leu	Ser	Gly	Ser	Thr	Tyr	Arg	Ala	Thr		
			500					505					510				
Gly	Glu	Gln	Ala	Leu	Leu	Leu	Ser	Val	Gly	Val	Val	Gly	Leu	Thr	Leu		
515						520						525					
Leu	Ala	Leu	Gly	Leu	Ser	Arg	Trp	Leu	Thr	Leu	Ile	Ser	Ile	Gly	Arg		
530						535					540						
Gly	Phe	Ala	Ser	Ala	Arg	Gly	Leu	Ser	Ala	Ser	Arg	Ala	Ser	Leu	Val		
545					550					555					560		
Leu	Leu	Ile	Leu	Val	Ala	Leu	Leu	Cys	Ala	Leu	Val	Thr	Ala	Thr	Met		
				565					570					575			
Gly	Pro	Val	Ser	Phe	Val	Gly	Leu	Ile	Ala	Pro	His	Met	Ala	Met	Met		
			580					585					590				
Leu	Gly	Ala	Gln	Arg	Ala	Pro	Ser	Gln	Leu	Leu	Leu	Ala	Ala	Leu	Val		
595						600						605					
Gly	Gly	Thr	Leu	Met	Leu	Trp	Ala	Asp	Trp	Leu	Gly	Gln	Ala	Leu	Leu		
610						615					620						
Phe	Pro	Ala	Gln	Ile	Ala	Ala	Gly	Thr	Leu	Val	Ala	Ile	Ile	Gly	Gly		
625					630					635					640		
Ser	Tyr	Phe	Leu	Leu	Leu	Leu	Leu	Ser	Gln	Arg	Ala	Arg					
			645					650									



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 <223> tolA protein

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<400> 27

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Ile	Ser	Leu	Ala	Met	His	Gly	Ala	Leu	Val	Ala	Ile	Leu	Leu	Trp	Gly
			20					25					30		
Ala	Asp	Phe	Thr	Met	Ser	Asp	Pro	Glu	Pro	Thr	Gly	Gln	Met	Ile	Glu
	35						40					45			
Ala	Val	Val	Ile	Asp	Pro	Gln	Leu	Val	Arg	Gln	Gln	Ala	Gln	Gln	Ile
	50					55					60				
Arg	Ser	Gln	Arg	Glu	Glu	Ala	Ala	Lys	Lys	Glu	Gln	Glu	Arg	Leu	Asp
65					70					75					80
Lys	Leu	Arg	Arg	Glu	Ser	Glu	Gln	Leu	Glu	Lys	Asn	Arg	Gln	Ala	Glu
				85					90					95	
Glu	Glu	Arg	Ile	Arg	Gln	Leu	Lys	Glu	Gln	Gln	Ala	Lys	Glu	Ala	Lys
			100					105					110		
Ala	Ala	Arg	Glu	Ala	Glu	Lys	Leu	Arg	Glu	Gln	Lys	Glu	Gln	Glu	Arg
			115				120					125			
Leu	Ala	Ala	Glu	Gln	Lys	Ala	Arg	Glu	Glu	Lys	Glu	Arg	Ala	Ala	Lys
	130					135					140				
Ala	Glu	Ala	Glu	Arg	Lys	Val	Lys	Glu	Glu	Ala	Ala	Lys	Lys	Ala	Glu
145					150					155					160
Gln	Glu	Arg	Val	Ala	Lys	Glu	Ala	Ala	Ala	Ala	Lys	Ala	Glu	Gln	Gln
				165				170						175	
Arg	Ile	Glu	Arg	Glu	Lys	Glu	Ala	Lys	Leu	Ala	Glu	Glu	Lys	Ala	Lys
			180					185					190		
Arg	Glu	Lys	Glu	Val	Ala	Ala	Lys	Ala	Glu	Gln	Glu	Arg	Leu	Ala	Lys





Gly Asn Glu Asp Gly Asn Asp Asp Gln Pro Lys Glu His Ala Ala Gly  
165 170 175

Asn

<210> 30  
<211> 106  
<212> PRT  
<213> Plasmodium falciparum

<220>  
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<220>  
<221> misc\_feature  
<223> gi|3845179

<400> 30

Met Tyr Ile Cys Phe Phe Phe Phe Phe Phe Phe Leu Val Ile Lys Leu  
1 5 10 15

Gly Glu Asp Glu Asn Phe Gly Ser Ser Cys Phe Tyr Ser Leu Gly Asn  
20 25 30

Thr Lys Ile Leu Thr Thr Val Tyr Gly Pro Asn Pro Asp Ser Lys Tyr  
35 40 45

Ala Thr Tyr Ser Lys Gly Lys Val Phe Leu Asp Val Lys Ser Leu Asn  
50 55 60

Ile Asn Thr Ile Gly Ala Ser Asp Arg Val Leu Tyr Ile Tyr Gly Phe  
65 70 75 80

Phe Phe Phe Phe Phe Phe Phe Phe Phe Phe Ile Leu Asn Arg Ser Tyr  
85 90 95

Phe Phe Leu Val Leu Phe Ile Ile Phe Ile  
100 105

<210> 31  
<211> 396  
<212> PRT  
<213> Plasmodium falciparum

<220>  
<221> misc\_feature  
<223> Circumsporozoite (CS) protein

<220>  
<221> misc\_feature  
<223> gi|4493889

<400> 31

Met Arg Lys Leu Ala Ile Leu Ser Val Ser Ser Phe Leu Phe Val Glu  
1 5 10 15

Ala Leu Phe Gln Glu Tyr Gln Cys Tyr Gly Ser Ser Ser Asn Thr Arg  
20 25 30

Val Leu Asn Glu Leu Asn Tyr Asp Asn Ala Gly Thr Asn Leu Tyr Asn  
35 40 45

Glu Leu Glu Met Asn Tyr Tyr Gly Lys Gln Glu Asn Trp Tyr Ser Leu  
50 55 60

Lys Lys Asn Ser Arg Ser Leu Gly Glu Asn Asp Asp Gly Asn Asn Glu  
65 70 75 80

Asp Asn Glu Lys Leu Arg Lys Pro Lys His Lys Lys Leu Lys Gln Pro  
85 90 95

Ala Asp Gly Asn Pro Asp Pro Asn Ala Asn Pro Asn Val Asp Pro Asn  
100 105 110

Ala Asn Pro Asn Val Asp Pro Asn Ala Asn Pro Asn Val Asp Pro Asn  
115 120 125

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
130 135 140

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
145 150 155 160

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
165 170 175

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
180 185 190

Ala Asn Pro Asn Val Asp Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
195 200 205

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
210 215 220

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
225 230 235 240

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
245 250 255

Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro Asn  
260 265 270

Lys Asn Asn Gln Gly Asn Gly Gln Gly His Asn Met Pro Asn Asp Pro  
275 280 285

Asn Arg Asn Val Asp Glu Asn Ala Asn Ala Asn Ser Ala Val Lys Asn  
290 295 300

Asn Asn Asn Glu Glu Pro Ser Asp Lys His Ile Lys Glu Tyr Leu Asn  
305 310 315 320

Lys Ile Gln Asn Ser Leu Ser Thr Glu Trp Ser Pro Cys Ser Val Thr  
325 330 335

Cys Gly Asn Gly Ile Gln Val Arg Ile Lys Pro Gly Ser Ala Asn Lys  
340 345 350

Pro Lys Asp Glu Leu Asp Tyr Ala Asn Asp Ile Glu Lys Lys Ile Cys  
355 360 365

Lys Met Glu Lys Cys Ser Ser Val Phe Asn Val Val Asn Ser Ser Ile  
370 375 380

Gly Leu Ile Met Val Leu Ser Phe Leu Phe Leu Asn  
385 390 395

<210> 32  
<211> 497  
<212> PRT  
<213> B. burgdorferi

<220>  
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<220>  
<221> misc\_feature  
<223> "Xaa" may be any amino acid

<220>  
<221> misc\_feature  
<223> gi|2688482

<400> 32

Met Asn Lys Thr Lys Asn Arg Ser Leu Thr Tyr Phe Ile Ile Leu Ser  
1 5 10 15

Cys Ile Ser Leu Phe Gly Ala Asn Asn Asn Thr Ile Ser Tyr Ser Ser  
20 25 30

Ile Glu Ile Pro Leu Glu Asp Leu Ser Glu Glu Phe Lys Ser Ser Gly  
35 40 45

Asn Lys Ser Asp Gln Ile Asn Thr Ser Lys His Leu Asn Lys Asn Ile  
50 55 60

Val Ser Tyr Glu Asp Pro Lys Lys Gly Lys Asp Leu Lys Leu Pro Glu  
65 70 75 80

Asn Ile Arg Asp Lys Lys Leu Pro Gln Lys Arg Met Asp Glu Asn Asp  
85 90 95

Leu Lys Ser Val Ile Glu Asn Tyr Glu Asn Lys Ile Lys Asn Ile Glu  
100 105 110

Lys Leu Leu Lys Thr Lys Asn Gln Lys Thr Ser Glu Asn Glu Asn Lys  
115 120 125

Lys Ile Glu Ser Ile Glu Lys Lys Ala Lys Lys Tyr Glu Ile Leu Thr  
130 135 140

Asn Lys Leu Lys Asn Glu Ile Val Glu Ile Lys Lys Leu Leu Asn Lys  
145 150 155 160

Lys Ile Lys Pro Lys Glu Asp Glu Asn Tyr Glu Lys Ile Asn Ile Glu  
165 170 175

Asn Ile Glu Glu Glu Thr Asp Asp Asp Phe Glu Asp Asn Tyr Glu Tyr  
180 185 190

Asn Asp Glu Ile Glu Xaa Thr Asn Glu Asp Asn Tyr Pro Ser Asn Glu  
195 200 205

Gly Ile Ile Asn Asn Leu Lys Glu Asn Leu Asn Glu Asn Glu Lys Tyr  
210 215 220

Tyr Ala Ile Asn Glu Lys Lys Ile Asp Glu Leu Glu Asp Arg Ile Asn  
225 230 235 240

Glu Asn Glu Asn Thr Ile Leu Asp Leu Gln Arg Glu Leu Arg Asn Phe  
245 250 255

Lys Lys Lys Asp Asn Ser Asp Lys Asn Leu Glu Glu Ile Glu Glu Asn  
260 265 270

Leu Ser Ser Ile Gly Arg Ile Ile Asn Asp Leu Lys Arg Lys Ile Ser  
275 280 285

Ala Asn Glu Ala Ile Asn Lys Glu Asn Gln Lys Lys Ile Arg Thr Asp  
290 295 300

Lys His Lys Leu Lys Glu Leu Glu Asp Lys Ile Lys Glu Asn Glu Glu  
305 310 315 320

Thr Ile Leu Lys Leu Gln Lys Glu Leu Asn Asn Phe Lys Lys Lys Glu

Protein = "P43343" "P43343"

	325		330		335
Ile Tyr Gln Lys Pro Leu Asn Glu Glu Thr Phe Thr Pro Ser Ile Thr					
	340		345		350
Ser Lys Asn Asp Asp Leu Glu Glu Asn Lys Lys Leu Lys Lys Glu Tyr					
	355		360		365
Leu Lys Pro Ile Glu Lys Lys Glu Ser Arg Asp Leu Glu Glu Asn Thr					
	370		375		380
Lys Ser Thr Pro Lys Thr Thr Met Ile Lys Thr Ala Asp Phe Gln Ile					
385		390		395	400
Tyr Pro Asp Ile Tyr Leu Asn Asn Tyr Lys Phe Lys Glu Lys Gly Asp					
	405		410		415
Gln Phe Ala Phe Lys Lys Glu Asn Thr Tyr Tyr Ile Glu Ile Asp Pro					
	420		425		430
Thr Asn Asn Leu Asn Glu Ala Leu Lys Asn His Glu Ile Ile Ser Lys					
	435		440		445
Tyr Lys Phe Glu Lys Tyr Phe Ile Asn Pro Ile Leu Lys Asn Lys Glu					
	450		455		460
Glu Phe Phe Arg Asn Leu Ile Glu Val Lys Asn Ile His Glu Leu Gly					
465		470		475	480
Ile Met Tyr Lys Asn Leu Lys Pro Glu Phe Lys Gln Ile Lys Ile Ile					
	485		490		495

Lys

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<210> 33
<211> 31
<212> PRT
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<220>
<221> misc_feature
<223> predicted coding region BB0148

<220>
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<223> gi|2688046

<400> 33

Met Pro Val Lys Lys Asn Ser Thr Lys Ile Lys Lys Lys Glu Thr Gln
1          5          10          15

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Ile Ala Ile Ala Leu Lys Ile Ile Ile Ile Ile Tyr Phe Phe Asp  
 20 25 30

<210> 34  
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<220>  
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<220>  
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<400> 34

Met Phe Gly Cys Leu Arg Ile His Val Phe Lys Ile Tyr Phe Ile Phe  
 1 5 10 15

Leu Ile Ile His Tyr Ile Leu Phe Ser Ile Leu Leu Met Ile  
 20 25 30

<210> 35  
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 <212> PRT  
 <213> B. burgdorferi

<220>  
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 <223> predicted coding region BB0212

<220>  
 <221> misc\_feature  
 <223> gi|2688103

<400> 35

Met Met Lys Lys Ile Lys Ser Glu Ile Asn Leu Leu Lys Ile Glu Lys  
 1 5 10 15

Asp Lys Asn Leu Ile Glu Leu Gly Lys Ile Leu Lys Asn Asn Asn Ile  
 20 25 30

Val Glu Leu Lys Asn Leu Asn His Tyr Pro Asn Leu Lys Leu Val Glu  
 35 40 45

Lys Glu Leu Tyr Gln Met Lys Ser Asn Leu Ser Lys Ser Glu Glu Asn  
 50 55 60



<211> 30  
<212> PRT  
<213> B. burgdorferi

<220>  
<221> misc\_feature  
<223> predicted coding region BB0425

<220>  
<221> misc\_feature  
<223> gi|2688333

<400> 36

Met Glu Asp Glu Arg Arg Glu Glu Leu Ser Lys Val Lys Ser Gln Lys  
1 5 10 15

Asn Lys Gln Asn Leu Leu Ile Phe Leu Asn Lys Lys Ile Lys  
20 25 30

<210> 37  
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<212> PRT  
<213> B. burgdorferi

<220>  
<221> misc\_feature  
<223> predicted coding region BB0433

<220>  
<221> misc\_feature  
<223> gi|2688343

<400> 37

Met His Lys Phe Phe Lys Leu Ile Leu Lys Leu Phe Ser Phe Tyr Lys  
1 5 10 15

Glu Ile Leu Gly Phe Lys Arg Arg Ala Lys Phe Ile Phe Cys Tyr Leu  
20 25 30

<210> 38  
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<213> B. burgdorferi

<220>  
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<223> predicted coding region BB0520

<220>  
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 <223> gi|2688447

<400> 38

Met Ser Lys Ser Thr Lys Asn Thr Thr Lys Ser Lys Asn Asp Thr Lys  
 1 5 10 15

Asn Ile Leu Ile Asn Lys Lys Ile Lys Phe Phe Ile Leu Thr Lys Lys  
 20 25 30

Tyr Thr Arg Thr Phe Tyr  
 35

<210> 39  
 <211> 36  
 <212> PRT  
 <213> B. burgdorferi

<220>  
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 <223> predicted coding region BB0609

<220>  
 <221> misc\_feature  
 <223> gi|2688540

<400> 39

Met Thr Met Ile Ile Ile Ile Phe Tyr Lys Tyr Leu Ile Pro Lys Ser  
 1 5 10 15

Ile Lys Asp Lys Asn Asn Lys Ser His Lys Thr Phe Ile Lys Lys Phe  
 20 25 30

Ile Ile Lys Tyr  
 35

<210> 40  
 <211> 31  
 <212> PRT  
 <213> B. burgdorferi

<220>  
 <221> misc\_feature  
 <223> predicted coding region BB0822

<220>  
 <221> misc\_feature  
 <223> gi|2688768

<400> 40

Met Pro Cys Gly Arg Lys Arg Lys Leu Lys Lys Ile Ser Thr His Lys  
1 5 10 15

Arg Lys Lys Lys Arg Arg Lys Asn Arg His Lys Lys Lys Asn Lys  
20 25 30

<210> 41

<211> 34

<212> PRT

<213> B. burgdorferi

<220>

<221> misc\_feature

<223> predicted coding region BB0848

<220>

<221> misc\_feature

<223> gi|2688793

<400> 41

Met Tyr Phe Cys Ile Ile Asp Leu Glu Phe Val Gly Val Leu Pro Tyr  
1 5 10 15

Phe Phe Ile Tyr Lys Phe Gly Glu Phe Tyr Phe Ser Phe Phe Gly Lys  
20 25 30

Trp Arg

<210> 42

<211> 51

<212> PRT

<213> C. jejuni

<220>

<221> misc\_feature

<223> highly acidic protein

<220>

<221> misc\_feature

<223> gi|6967728

<400> 42

Met Ala Tyr Glu Asp Glu Glu Asp Leu Asn Tyr Asp Asp Tyr Glu Asn  
1 5 10 15



Glu Lys Gln Gln Ile Phe Leu Ile Gln Asn Lys Leu Ser Glu Ile Glu  
 20 25 30

Lys Asn Ile Lys Glu  
 35

<210> 45

<211> 74

<212> PRT

<213> C. jejuni

<220>

<221> misc\_feature

<223> small hydrophobic protein

<220>

<221> misc\_feature

<223> gi|6968265

<400> 45

Met Leu Glu Phe Ile Phe Thr Leu Ile Leu Asp Phe Thr Phe Tyr Ser  
 1 5 10 15

Ile Lys Thr Leu Glu Lys Val Phe Leu Gly Arg Thr Ala Leu Val Ile  
 20 25 30

Leu Phe Val Val Phe Ile Ala Leu Phe Cys Val Lys Gly Leu Phe Leu  
 35 40 45

Tyr Ile Leu Leu Ala Leu Glu Leu Phe Leu Leu Leu Tyr Leu Phe Leu  
 50 55 60

Gly Ile Leu Phe Leu Arg Phe Tyr Lys Ser  
 65 70

<210> 46

<211> 46

<212> PRT

<213> C. jejuni

<220>

<221> misc\_feature

<223> very hypothetical protein Cj0974

<220>

<221> misc\_feature

<223> gi|6968409

<400> 46

Met Leu Lys Met Ile Lys Ile Gln Lys Val Lys Ser Leu Leu Asp Leu  
1 5 10 15

Val Lys Lys Leu Lys Asn Lys Gln Ser Leu Lys Ile Lys Asn Gln Thr  
20 25 30

Asn Thr Lys Glu Asn Leu Asn Lys Thr His Tyr Leu Thr Ile  
35 40 45

<210> 47

<211> 78

<212> PRT

<213> C. jejuni

<220>

<221> misc\_feature

<223> very hypothetical protein

<220>

<221> misc\_feature

<223> gi|6968423

<400> 47

Met Leu Lys Ile Pro Tyr Phe Ser Phe Leu Lys Leu Asp Phe Glu Ile  
1 5 10 15

Tyr His Leu Asn Thr Ser Lys Asn Phe Tyr Gly Phe Phe Ile Leu Tyr  
20 25 30

Phe Ser Phe Phe Ile Phe Lys Leu Ile Tyr Lys Phe Ser Lys Ser Asn  
35 40 45

Lys Lys Ile Tyr Lys Lys Ile Ile Lys Leu Lys Lys Ile Ile Lys Asp  
50 55 60

Asn Lys Tyr Leu Ile Phe Leu Cys Tyr Ile Leu Ile Asn Ile  
65 70 75

<210> 48

<211> 30

<212> PRT

<213> C. jejuni

<220>

<221> misc\_feature

<223> hypothetical protein Cj0748

<220>

<221> misc\_feature

<223> gi|6968200



<400> 48

Met Leu Glu Thr Leu Lys Lys Tyr Ala Glu Asn Gln Gly Ile Glu Asp  
1 5 10 15

Asn Tyr Pro Lys Lys Ile Tyr Asn Gln Lys Glu Lys Lys Pro  
20 25 30

<210> 49

<211> 168

<212> PRT

<213> C. pneumoniae CWL029

<220>

<221> misc\_feature

<223> CT670 hypothetical protein

<220>

<221> misc\_feature

<223> gi|4377009

<400> 49

Met Ala Lys Tyr Pro Leu Glu Pro Val Leu Ala Ile Lys Lys Asp Arg  
1 5 10 15

Val Asp Arg Ala Glu Lys Val Val Lys Glu Lys Arg Arg Leu Leu Glu  
20 25 30

Ile Glu Gln Glu Lys Leu Arg Glu Lys Glu Ala Glu Arg Asp Lys Val  
35 40 45

Lys Asn His Tyr Met Gln Lys Ile Gln Gln Leu Arg Asp Leu Leu Asp  
50 55 60

Glu Gly Thr Thr Ser Asp Ala Val Leu Gln Ile Lys Ser Tyr Ile Lys  
65 70 75 80

Val Val Ala Val Gln Leu Ser Glu Glu Glu Glu Lys Val Asn Lys Gln  
85 90 95

Lys Glu Val Val Leu Ala Ala Ser Lys Glu Leu Glu Lys Ala Glu Val  
100 105 110

Asn Leu Ala Lys Arg Arg Lys Glu Glu Glu Lys Thr Arg Leu His Lys  
115 120 125

Glu Glu Trp Met Lys Glu Ala Leu Lys Glu Glu Ala Arg Ala Glu Glu  
130 135 140

Lys Glu Gln Asp Glu Met Gly Gln Leu Leu Phe Gln Leu Arg Gln Lys

145 150 155 160

Lys Lys Arg Glu Ser Gly Gly Ser  
165

<210> 50  
<211> 444  
<212> PRT  
<213> C. pneumoniae CWL029

<220>  
<221> misc\_feature  
<223> CT579 hypothetical protein

<220>  
<221> misc\_feature  
<223> gi|4377120

<400> 50

Met Thr Ser Gly Val Ser Gly Ser Ser Ser Gln Asp Pro Thr Leu Ala  
1 5 10 15

Ala Gln Leu Ala Gln Ser Ser Gln Lys Ala Gly Asn Ala Gln Ser Gly  
20 25 30

His Asp Thr Lys Asn Val Thr Lys Gln Gly Ala Gln Ala Glu Val Ala  
35 40 45

Ala Gly Gly Phe Glu Asp Leu Ile Gln Asp Ala Ser Ala Gln Ser Thr  
50 55 60

Gly Lys Lys Glu Ala Thr Ser Ser Thr Thr Lys Ser Ser Lys Gly Glu  
65 70 75 80

Lys Ser Glu Lys Ser Gly Lys Ser Lys Ser Ser Thr Ser Val Ala Ser  
85 90 95

Ala Ser Glu Thr Ala Thr Ala Gln Ala Val Gln Gly Pro Lys Gly Leu  
100 105 110

Arg Gln Asn Asn Tyr Asp Ser Pro Ser Leu Pro Thr Pro Glu Ala Gln  
115 120 125

Thr Ile Asn Gly Ile Val Leu Lys Lys Gly Met Gly Thr Leu Ala Leu  
130 135 140

Leu Gly Leu Val Met Thr Leu Met Ala Asn Ala Ala Gly Glu Ser Trp  
145 150 155 160

Lys Ala Ser Phe Gln Ser Gln Asn Gln Ala Ile Arg Ser Gln Val Glu  
165 170 175

Ser Ala Pro Ala Ile Gly Glu Ala Ile Lys Arg Gln Ala Asn His Gln  
180 185 190

Ala Ser Ala Thr Glu Ala Gln Ala Lys Gln Ser Leu Ile Ser Gly Ile  
195 200 205

Val Asn Ile Val Gly Phe Thr Val Ser Val Gly Ala Gly Ile Phe Ser  
210 215 220

Ala Ala Lys Gly Ala Thr Ser Ala Leu Lys Ser Ala Ser Phe Ala Lys  
225 230 235 240

Glu Thr Gly Ala Ser Ala Ala Gly Gly Ala Ala Ser Lys Ala Leu Thr  
245 250 255

Ser Ala Ser Ser Ser Val Gln Gln Thr Met Ala Ser Thr Ala Lys Ala  
260 265 270

Ala Thr Thr Ala Ala Ser Ser Ala Gly Ser Ala Ala Thr Lys Ala Ala  
275 280 285

Ala Asn Leu Thr Asp Asp Met Ala Ala Ala Ala Ser Lys Met Ala Ser  
290 295 300

Asp Gly Ala Ser Lys Ala Ser Gly Gly Leu Phe Gly Glu Val Leu Asn  
305 310 315 320

Lys Pro Asn Trp Ser Glu Lys Val Ser Arg Gly Met Asn Val Val Lys  
325 330 335

Thr Gln Gly Ala Arg Val Ala Ser Phe Ala Gly Asn Ala Leu Ser Ser  
340 345 350

Ser Met Gln Met Ser Gln Leu Met His Gly Leu Thr Ala Ala Val Glu  
355 360 365

Gly Leu Ser Ala Gly Gln Thr Gly Ile Glu Val Ala His His Gln Arg  
370 375 380

Leu Ala Gly Gln Ala Glu Ala Gln Ala Glu Val Leu Lys Gln Met Ser  
385 390 395 400

Ser Val Tyr Gly Gln Gln Ala Gly Gln Ala Gly Gln Leu Gln Glu Gln  
405 410 415

Ala Met Gln Ser Phe Asn Thr Ala Leu Gln Thr Leu Gln Asn Ile Ala  
420 425 430

Asp Ser Gln Thr Gln Thr Thr Ser Ala Ile Phe Asn  
435 440

<210> 51

<211> 493

<212> PRT

<213> C. pneumoniae CWL029

<220>  
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 <223> CT578 hypothetical protein

<220>  
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 <223> gi|4377121

<400> 51

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Met Ser Ile Ser Ser Ser Ser Gly Pro Asp Asn Gln Lys Asn Ile Met
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Ser Gln Val Leu Thr Ser Thr Pro Gln Gly Val Pro Gln Gln Asp Lys
          20          25          30

Leu Ser Gly Asn Glu Thr Lys Gln Ile Gln Gln Thr Arg Gln Gly Lys
          35          40          45

Asn Thr Glu Met Glu Ser Asp Ala Thr Ile Ala Gly Ala Ser Gly Lys
          50          55          60

Asp Lys Thr Ser Ser Thr Thr Lys Thr Glu Thr Ala Pro Gln Gln Gly
65          70          75          80

Val Ala Ala Gly Lys Glu Ser Ser Glu Ser Gln Lys Ala Gly Ala Asp
          85          90          95

Thr Gly Val Ser Gly Ala Ala Ala Thr Thr Ala Ser Asn Thr Ala Thr
          100          105          110

Lys Ile Ala Met Gln Thr Ser Ile Glu Glu Ala Ser Lys Ser Met Glu
          115          120          125

Ser Thr Leu Glu Ser Leu Gln Ser Leu Ser Ala Ala Gln Met Lys Glu
          130          135          140

Val Glu Ala Val Val Val Ala Ala Leu Ser Gly Lys Ser Ser Gly Ser
145          150          155          160

Ala Lys Leu Glu Thr Pro Glu Leu Pro Lys Pro Gly Val Thr Pro Arg
          165          170          175

Ser Glu Val Ile Glu Ile Gly Leu Ala Leu Ala Lys Ala Ile Gln Thr
          180          185          190

Leu Gly Glu Ala Thr Lys Ser Ala Leu Ser Asn Tyr Ala Ser Thr Gln
          195          200          205

Ala Gln Ala Asp Gln Thr Asn Lys Leu Gly Leu Glu Lys Gln Ala Ile
210          215          220

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<220>  
 <221> misc\_feature  
 <223> CT753 hypothetical protein

<220>  
 <221> misc\_feature  
 <223> gi|4377216

<400> 52

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Met Arg Asn Met Glu Ala Lys Lys Ile Lys Glu Leu Ser Lys Glu Ala
1          5          10          15
Gln Leu Leu Lys Lys Leu Arg Glu Lys Ser Arg Val Leu Asp Glu Lys
          20          25          30
Asn Lys Arg Lys Ala Trp Val Ala Lys Leu Val Ala Met Pro Glu Ser
          35          40          45
Ile Arg Glu Ile Glu Lys Glu Glu Arg Val Glu Thr Pro Gln Leu Phe
          50          55          60
Gln Ala Ile Ala Glu Lys Ile Leu Glu Glu Gly Val
65          70          75

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<210> 53  
 <211> 755  
 <212> PRT  
 <213> C. pneumoniae CWL029

<220>  
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 <223> CT456 hypothetical protein

<220>  
 <221> misc\_feature  
 <223> gi|4376866

<400> 53

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Met Ala Ala Pro Ile Asn Gln Pro Ser Thr Thr Thr Gln Ile Thr Gln
1          5          10          15
Thr Gly Gln Thr Thr Thr Thr Thr Val Gly Ser Leu Gly Glu His
          20          25          30
Ser Val Thr Thr Thr Gly Ser Gly Ala Ala Ala Gln Thr Ser Gln Thr
          35          40          45
Val Thr Leu Ile Ala Asp His Glu Met Gln Glu Ile Ala Ser Gln Asp

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Ala	His	Ser	Thr	Ser	His	Thr	Gly	Pro	Gly	Thr	Pro	Val	Gly	Ala	Thr		
		355					360					365					
Val	Val	Pro	Asn	Val	Asn	Val	Asn	Leu	Gly	Gly	Ile	Lys	Val	Asp	Leu		
		370					375				380						
Gly	Gly	Ile	Asn	Leu	Gly	Gly	Ile	Thr	Thr	Asn	Val	Thr	Thr	Glu	Glu		
385					390					395					400		
Gly	Gly	Gly	Thr	Asn	Ile	Thr	Ser	Thr	Lys	Ser	Thr	Ser	Thr	Asp	Asp		
				405					410					415			
Lys	Val	Ser	Ile	Thr	Ser	Thr	Gly	Ser	Gln	Ser	Thr	Ile	Glu	Glu	Asp		
			420					425					430				
Thr	Ile	Gln	Phe	Asp	Asp	Pro	Gly	Gln	Gly	Glu	Asp	Asp	Asn	Ala	Ile		
		435					440					445					
Pro	Gly	Thr	Asn	Thr	Pro	Pro	Pro	Pro	Gly	Pro	Pro	Pro	Asn	Leu	Ser		
		450				455						460					
Ser	Ser	Arg	Leu	Leu	Thr	Ile	Ser	Asn	Ala	Ser	Leu	Asn	Gln	Val	Leu		
465					470					475					480		
Gln	Asn	Val	Arg	Gln	His	Leu	Asn	Thr	Ala	Tyr	Asp	Ser	Asn	Gly	Asn		
				485					490					495			
Ser	Val	Ser	Asp	Leu	Asn	Gln	Asp	Leu	Gly	Gln	Val	Val	Lys	Asn	Ser		
			500					505					510				
Glu	Asn	Gly	Val	Asn	Phe	Pro	Thr	Val	Ile	Leu	Pro	Lys	Thr	Thr	Gly		
		515					520					525					
Asp	Thr	Asp	Pro	Ser	Gly	Gln	Ala	Thr	Gly	Gly	Val	Thr	Glu	Gly	Gly		
	530					535					540						
Gly	His	Ile	Arg	Asn	Ile	Ile	Gln	Arg	Asn	Thr	Gln	Ser	Thr	Gly	Gln		
545					550					555					560		
Ser	Glu	Gly	Ala	Thr	Pro	Thr	Pro	Gln	Pro	Thr	Ile	Ala	Lys	Ile	Val		
				565				570						575			
Thr	Ser	Leu	Arg	Lys	Ala	Asn	Val	Ser	Ser	Ser	Ser	Val	Leu	Pro	Gln		
			580					585					590				
Pro	Gln	Val	Ala	Thr	Thr	Ile	Thr	Pro	Gln	Ala	Arg	Thr	Ala	Ser	Thr		
		595					600					605					
Ser	Thr	Thr	Ser	Ile	Gly	Thr	Gly	Thr	Glu	Ser	Thr	Ser	Thr	Thr	Ser		
	610					615					620						
Thr	Gly	Thr	Gly	Thr	Gly	Ser	Val	Ser	Thr	Gln	Ser	Thr	Gly	Val	Gly		
625					630					635					640		



Thr Pro Thr Thr Thr Thr Arg Ser Thr Gly Thr Ser Ala Thr Thr Thr  
645 650 655

Thr Ser Ser Ala Ser Thr Gln Thr Pro Gln Ala Pro Leu Pro Ser Gly  
660 665 670

Thr Arg His Val Ala Thr Ile Ser Leu Val Arg Asn Ala Ala Gly Arg  
675 680 685

Ser Ile Val Leu Gln Gln Gly Gly Arg Ser Gln Ser Phe Pro Ile Pro  
690 695 700

Pro Ser Gly Thr Gly Thr Gln Asn Met Gly Ala Gln Leu Trp Ala Ala  
705 710 715 720

Ala Ser Gln Val Ala Ser Thr Leu Gly Gln Val Val Asn Gln Ala Ala  
725 730 735

Thr Ala Gly Ser Gln Pro Ser Ser Arg Arg Ser Ser Pro Thr Ser Pro  
740 745 750

Arg Arg Lys  
755

<210> 54  
<211> 221  
<212> PRT  
<213> C. pneumoniae CWL029

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<220>  
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<400> 54

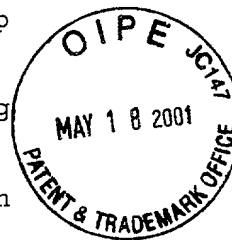
Met Ser Thr Val Thr Thr Glu Pro Cys Ser Ser Ile His Ile Ser Leu  
1 5 10 15

Asn Asn Asp Trp Arg Asp Ser Gln Pro Tyr Ser Leu Asp Arg Ala Ser  
20 25 30

Glu Leu Leu His Phe Arg Phe Leu Pro Ser Leu Val Phe Ser Asn Trp  
35 40 45

Lys Val Glu Gln Gln Ile Glu Thr Leu Cys His Lys Ser Glu Lys Arg  
50 55 60

Arg Leu Ile Ser Pro Leu Ala Lys Trp Leu Gly Lys Leu His Lys Gln  
65 70 75 80



Asp Leu Leu Cys Pro Pro Ala Pro Pro Val Ser Val Cys Trp Ile Asn  
85 90 95

Ala His Val Gly Tyr Gly Val Phe Ala Arg Asp Glu Ile Ala Pro Trp  
100 105 110

Thr Tyr Ile Gly Glu Tyr Thr Gly Ile Leu Arg His Arg Gln Ala Ile  
115 120 125

Trp Met Asp Glu Asn Asp Tyr Cys Phe Arg Tyr Pro Met Pro Leu Phe  
130 135 140

Thr Leu Arg Tyr Phe Thr Ile Asp Ser Gly Lys Gln Gly Asn Val Thr  
145 150 155 160

Arg Phe Ile Asn His Ser Glu Gln Pro Asn Ala Glu Ala Ile Gly Val  
165 170 175

Phe Ser Glu Gly Leu Phe His Val Ile Ile Arg Thr Val Ala Pro Ile  
180 185 190

Tyr Ala Gly Gln Glu Ile Cys Tyr His Tyr Gly Pro Leu Tyr Trp Lys  
195 200 205

His Arg Lys Lys Arg Glu Glu Phe Ile Pro Glu Glu Glu  
210 215 220

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<213> C. pneumoniae CWL029

<220>  
<221> misc\_feature  
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<220>  
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<400> 55

Met Ser Tyr Pro Asp Ile Ser Asn Val Gln Ala Ser Ser Ile Gln Ser  
1 5 10 15

Ala Leu Leu His Lys Thr Ser Asp Gln Ile Gln Gln Lys Arg Cys Phe  
20 25 30

Lys Gln Ser Thr Phe Val Ile Leu Ala Val Ser Leu Val Ile Ile Gly  
35 40 45

Ser Leu Phe Leu Leu Ala Gly Val Ala Ile Leu Thr Val Phe Ser His

50 55 60

Gly Val Leu Ser Leu Val Phe Gly Val Leu Gly Ile Val Leu Gly Leu  
65 70 75 80

Leu Leu Leu Ala Gly Gly Val Gly Leu Leu Val Glu Glu Ala Lys Ser  
85 90 95

Leu Leu

<210> 56  
<211> 64  
<212> PRT  
<213> C. pneumoniae CWL029

<220>  
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<220>  
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<223> gi|4376770

<400> 56

Met Ile Lys Gln Ala Cys Lys Phe Tyr Leu Leu Gln Cys Leu Leu Cys  
1 5 10 15

Ala Leu Tyr Trp Leu Leu Lys Tyr Cys Arg Lys Leu Leu Lys Gly Thr  
20 25 30

Leu His His Ser Glu Glu Thr Leu Tyr Gln Ala Leu Leu Ser Ser Leu  
35 40 45

Ile Asp Leu Leu Tyr Gln Leu Lys Gln Leu Pro Ala Pro Thr Asn Glu  
50 55 60

<210> 57  
<211> 50  
<212> PRT  
<213> C. pneumoniae CWL029

<220>  
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<223> hypothetical protein

<220>  
<221> misc\_feature  
<223> gi|4376779

<400> 57

Met Arg Thr Tyr Thr Arg Ser Pro Lys Gln Ser Gly Val Glu Arg Lys  
1 5 10 15  
Gln Glu Asp Ala Glu Thr Ser Phe Ile Glu Thr Pro Lys Gly Ile Leu  
20 25 30  
Lys Lys Pro Gly Asn Lys Asp Pro Lys Gly Lys His Val His Trp Lys  
35 40 45  
Asp Ser  
50

<210> 58

<211> 775

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<213> C. pneumoniae CWL029

<220>

<221> misc\_feature

<223> hypothetical protein

<220>

<221> misc\_feature

<223> gi|4376756

<400> 58

Met Ala Ser Gly Ile Gly Gly Ser Ser Gly Leu Gly Lys Ile Pro Pro  
1 5 10 15  
Lys Asp Asn Gly Asp Arg Ser Arg Ser Pro Ser Pro Lys Gly Glu Leu  
20 25 30  
Gly Ser His Glu Ile Ser Leu Pro Pro Gln Glu His Gly Glu Glu Gly  
35 40 45  
Ala Ser Gly Ser Ser His Ile His Ser Ser Ser Ser Phe Leu Pro Glu  
50 55 60  
Asp Gln Glu Ser Gln Ser Ser Ser Ser Ala Ala Ser Ser Pro Gly Phe  
65 70 75 80  
Phe Ser Arg Val Arg Ser Gly Val Asp Arg Ala Leu Lys Ser Phe Gly  
85 90 95  
Asn Phe Phe Ser Ala Glu Ser Thr Ser Gln Ala Arg Glu Thr Arg Gln  
100 105 110  
Ala Phe Val Arg Leu Ser Lys Thr Ile Thr Ala Asp Glu Arg Arg Asp  
115 120 125



420					425					430						
Thr	Glu	Arg	Thr	Gly	Ser	Pro	His	Asp	Val	Pro	Arg	Arg	Asn	Gly	Ser	
435					440					445						
Pro	Arg	Glu	Asp	Ser	Pro	Leu	Met	Asn	Ala	Leu	Val	Gly	Trp	Ala	His	
450					455					460						
Lys	His	Gly	Ala	Lys	Thr	Lys	Glu	Ser	Ser	Glu	Ser	Ser	Thr	Pro	Glu	
465					470					475					480	
Ile	Ser	Ile	Ser	Ala	Pro	Ile	Val	Arg	Gly	Trp	Ser	Gln	Asp	Ser	Ser	
485					490					495						
Val	Ser	Phe	Ile	Val	Met	Glu	Asp	Asp	His	Ile	Phe	Tyr	Asp	Val	Pro	
500					505					510						
Arg	Arg	Lys	Asp	Gly	Ile	Tyr	Asp	Val	Pro	Ser	Ser	Pro	Arg	Trp	Ser	
515					520					525						
Pro	Ala	Arg	Glu	Leu	Glu	Glu	Asp	Val	Phe	Gly	Asp	Tyr	Glu	Val	Pro	
530					535					540						
Ile	Thr	Ser	Ala	Glu	Pro	Ser	Lys	Asp	Lys	Asn	Ile	Tyr	Met	Thr	Pro	
545					550					555					560	
Arg	Leu	Ala	Thr	Pro	Ala	Ile	Tyr	Asp	Leu	Pro	Ser	Arg	Pro	Gly	Ser	
565					570					575						
Ser	Gly	Ser	Ser	Arg	Ser	Pro	Ser	Ser	Asp	Arg	Val	Arg	Ser	Ser	Ser	
580					585					590						
Pro	Asn	Arg	Arg	Gly	Val	Pro	Leu	Pro	Pro	Val	Pro	Ser	Pro	Ala	Met	
595					600					605						
Ser	Glu	Glu	Gly	Ser	Ile	Tyr	Glu	Asp	Met	Ser	Gly	Ala	Ser	Gly	Ala	
610					615					620						
Gly	Glu	Ser	Asp	Tyr	Glu	Asp	Met	Ser	Arg	Ser	Pro	Ser	Pro	Arg	Gly	
625					630					635					640	
Asp	Leu	Asp	Glu	Pro	Ile	Tyr	Ala	Asn	Thr	Pro	Glu	Asp	Asn	Pro	Phe	
645					650					655						
Thr	Gln	Arg	Asn	Ile	Asp	Arg	Ile	Leu	Gln	Glu	Arg	Ser	Gly	Gly	Ala	
660					665					670						
Ser	Ala	Ser	Pro	Val	Glu	Pro	Ile	Tyr	Asp	Glu	Ile	Pro	Trp	Ile	His	
675					680					685						
Gly	Arg	Pro	Pro	Ala	Thr	Leu	Pro	Arg	Pro	Glu	Asn	Thr	Leu	Thr	Asn	
690					695					700						
Val	Ser	Leu	Arg	Val	Ser	Pro	Gly	Phe	Gly	Pro	Glu	Val	Arg	Ala	Ala	
705					710					715					720	

Leu Leu Ser Glu Ser Val Ser Ala Val Met Val Glu Ala Glu Ser Ile  
                     725                    730                    735  
 Val Pro Pro Thr Glu Pro Gly Asp Gly Glu Ser Glu Tyr Leu Glu Pro  
                     740                    745                    750  
 Leu Gly Gly Leu Val Ala Thr Thr Lys Ile Leu Leu Gln Lys Gly Trp  
                     755                    760                    765  
 Pro Arg Gly Glu Ser Asn Ala  
                     770                    775

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 <212> PRT  
 <213> C. trachomatis

<220>  
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<220>  
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 <223> gi|3328515

<400> 59

Met Gly Asp Val Met Ile Gln Ser Val Lys Thr Glu Ser Gly Leu Val  
 1                    5                    10                    15  
 Glu Gly His Arg Gly Ile Cys Asp Ser Leu Gly Arg Val Val Gly Ala  
                     20                    25                    30  
 Leu Ala Lys Val Ala Lys Leu Val Val Ala Leu Ala Ala Leu Val Leu  
                     35                    40                    45  
 Asn Gly Ala Leu Cys Val Leu Ser Leu Val Ala Leu Cys Val Gly Ala  
                     50                    55                    60  
 Thr Pro Val Gly Pro Leu Ala Val Leu Val Ala Thr Thr Leu Ala Ser  
 65                    70                    75                    80  
 Phe Leu Cys Ala Ala Cys Val Leu Phe Ile Ala Ala Lys Asp Arg Gly  
                     85                    90                    95  
 Trp Ile Ala Ser Thr Asn Lys Cys  
                     100

<210> 60  
 <211> 439  
 <212> PRT  
 <213> C. trachomatis

<220>  
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<220>  
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 <223> gi|3329021

<400> 60

Met	Thr	Thr	Gly	Val	Arg	Gly	Asp	Asn	Ala	Pro	Asp	Pro	Ser	Leu	Leu	1	5	10	15
Ala	Gln	Leu	Thr	Gln	Asn	Ala	Asn	Ser	Ala	Ser	Ala	Ala	Ser	Thr	Gly	20	25	30	
Lys	Asn	Gly	Gln	Val	Ala	Gly	Ala	Lys	Gln	Glu	Asn	Val	Asp	Ala	Ser	35	40	45	
Phe	Glu	Asp	Leu	Leu	Gln	Asp	Ala	Gln	Gly	Thr	Gly	Gly	Ser	Lys	Lys	50	55	60	
Ala	Thr	Ala	Asn	Gln	Thr	Ser	Lys	Ser	Gly	Lys	Ser	Glu	Lys	Ala	Gln	65	70	75	80
Ala	Ser	Ser	Gly	Thr	Ser	Thr	Thr	Thr	Ser	Val	Ala	Gln	Ala	Ser	Gln	85	90	95	
Thr	Ala	Thr	Ala	Gln	Ala	Val	His	Gly	Ala	Arg	Asp	Ser	Gly	Phe	Asn	100	105	110	
Ser	Asp	Gly	Ser	Ala	Thr	Leu	Pro	Ser	Pro	Thr	Gly	Thr	Glu	Val	Asn	115	120	125	
Gly	Val	Val	Leu	Arg	Lys	Gly	Met	Gly	Thr	Leu	Ala	Leu	Met	Gly	Leu	130	135	140	
Ile	Met	Thr	Leu	Leu	Ala	Gln	Ala	Ser	Ala	Lys	Ser	Trp	Ser	Ser	Ser	145	150	155	160
Phe	Gln	Gln	Gln	Asn	Gln	Ala	Ile	Gln	Asn	Gln	Val	Ala	Met	Ala	Pro	165	170	175	
Glu	Ile	Gly	Asn	Ala	Ile	Arg	Thr	Gln	Ala	Asn	His	Gln	Ala	Gln	Ala	180	185	190	
Thr	Glu	Leu	Gln	Ala	Gln	Gln	Ser	Leu	Ile	Ser	Gly	Ile	Thr	Asn	Ile	195	200	205	
Val	Gly	Phe	Ala	Val	Ser	Val	Gly	Gly	Gly	Ile	Leu	Ser	Ala	Ser	Lys	210	215	220	



Ser Leu Gly Gly Leu Lys Ser Ala Ala Phe Thr Asn Glu Thr Ala Ser  
 225 230 235 240  
 Ala Thr Thr Ser Ala Thr Ser Ser Leu Ala Lys Thr Ala Thr Ser Ala  
 245 250 255  
 Leu Asp Asp Val Ala Gly Thr Ala Thr Ala Val Gly Ala Lys Ala Thr  
 260 265 270  
 Ser Gly Ala Ala Ser Ala Ala Ser Ser Ala Ala Thr Lys Leu Thr Gln  
 275 280 285  
 Asn Met Ala Glu Ser Ala Ser Lys Thr Leu Ser Gln Thr Ala Ser Lys  
 290 295 300  
 Ser Ala Gly Gly Leu Phe Gly Gln Ala Leu Asn Thr Pro Ser Trp Ser  
 305 310 315 320  
 Glu Lys Val Ser Arg Gly Met Asn Val Val Lys Thr Gln Gly Thr Arg  
 325 330 335  
 Ala Ala Lys Phe Ala Gly Arg Ala Leu Ser Ser Ala Met Asn Ile Ser  
 340 345 350  
 Gln Met Val His Gly Leu Thr Ala Gly Ile Asp Gly Ile Val Gly Gly  
 355 360 365  
 Val Ile Gly Ala Gln Val Ala Gln Glu Gln Arg Met Ala Gly Met Ala  
 370 375 380  
 Glu Ala Arg Ala Glu Glu Leu Lys Ser Leu Asn Ser Val Gln Ala Gln  
 385 390 395 400  
 Tyr Ala Ser Gln Ala Gln Gln Leu Gln Glu Gln Ser Gln Gln Ser Phe  
 405 410 415  
 Asn Ser Ala Leu Gln Thr Leu Gln Ser Ile Ser Asp Ser Ala Leu Gln  
 420 425 430  
 Thr Thr Ala Ser Met Phe Asn  
 435

<210> 61  
 <211> 168  
 <212> PRT  
 <213> C. trachomatis

<220>  
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 <223> hypothetical protein

<220>  
 <221> misc\_feature  
 <223> gi|3329121

<400> 61

Met Val Arg Tyr Pro Leu Glu Pro Val Leu Ser Ile Lys Lys Asp Arg  
1 5 10 15  
Val Asp Arg Ala Glu Lys Val Val Lys Glu Lys Arg Arg Leu Leu Glu  
20 25 30  
Leu Glu Gln Glu Lys Leu Arg Glu Arg Glu Ser Glu Arg Asp Lys Val  
35 40 45  
Lys Asn His Tyr Met Gln Lys Ile Arg Gln Leu Arg Glu Gln Leu Asp  
50 55 60  
Asp Gly Thr Thr Ser Asp Ala Ile Leu Lys Met Lys Ala Tyr Ile Lys  
65 70 75 80  
Val Val Ala Ile Gln Leu Ser Glu Glu Glu Glu Lys Val Asn Lys Gln  
85 90 95  
Lys Glu Asn Val Leu Ala Ala Ser Lys Glu Leu Glu Arg Ala Glu Val  
100 105 110  
Glu Leu Thr Lys Arg Arg Lys Glu Glu Glu Lys Thr Arg Leu His Lys  
115 120 125  
Glu Glu Trp Met Lys Glu Ala Leu Lys Glu Glu Ala Arg Gln Glu Glu  
130 135 140  
Lys Glu Gln Asp Glu Met Gly Gln Leu Leu His Gln Leu His Lys Gln  
145 150 155 160  
Lys Gln Arg Glu Ser Gly Glu Asn  
165

<210> 62

<211> 819

<212> PRT

<213> H. influenzae

<220>

<221> misc\_feature

<223> conserved hypothetical protein

<220>

<221> misc\_feature

<223> gi|1574537

<400> 62

Met Ala Asp Val Leu Ser Arg Phe Asn Ser Gly Lys Leu Trp Asp Phe

1	5	10	15
Lys Gly Gly Ile His Pro Pro Glu Met Lys Ser Gln Ser Asn Ser Gln	20	25	30
Pro Leu Arg His Leu Pro Leu Gly Thr Asp Phe Tyr Ile Pro Leu Lys	35	40	45
Gln His Leu Gly Thr Thr Gly Asn Leu Leu Ile Lys Glu Gly Asp Tyr	50	55	60
Val Leu Lys Gly Gln Ala Leu Thr Lys Gly Asp Gly Leu Arg Met Leu	65	70	75
Pro Val His Ala Pro Thr Ser Gly Thr Ile Lys Ser Ile Lys Pro Tyr	85	90	95
Val Ala Thr His Pro Ser Gly Leu Asp Glu Pro Thr Ile His Leu Gln	100	105	110
Ala Asp Gly Leu Asp Gln Trp Ile Glu Arg Asn Pro Ile Asp Asp Phe	115	120	125
Ser Thr Leu Ser Ser Glu Gln Leu Ile His Lys Ile Tyr Gln Ala Gly	130	135	140
Ile Ala Gly Leu Gly Gly Ala Val Phe Pro Thr Ala Ala Lys Ile Gln	145	150	155
Ser Ala Glu Gln Lys Val Lys Leu Leu Ile Ile Asn Gly Ala Glu Cys	165	170	175
Glu Pro Tyr Ile Thr Cys Asp Asp Arg Leu Met Arg Glu Arg Ala Asp	180	185	190
Glu Ile Ile Lys Gly Ile Arg Ile Leu Arg Tyr Ile Leu His Pro Glu	195	200	205
Lys Val Val Ile Ala Ile Glu Asp Asn Lys Pro Glu Ala Ile Ser Ala	210	215	220
Ile Arg Asn Ala Leu Gln Gly Ala Asn Asp Ile Ser Ile Arg Val Ile	225	230	235
Pro Thr Lys Tyr Pro Ser Gly Ala Thr Lys Gln Leu Ile Tyr Leu Leu	245	250	255
Thr Gly Ile Glu Val Pro Ser Gly Glu Arg Ser Ser Ser Ile Gly Val	260	265	270
Leu Met Gln Asn Val Gly Thr Met Phe Ala Ile Lys Arg Ala Ile Ile	275	280	285
Asn Asp Glu Pro Leu Ile Glu Arg Val Val Thr Leu Thr Gly Asn Lys	290	295	300

Ile	Ala	Glu	Lys	Gly	Asn	Tyr	Trp	Val	Arg	Leu	Gly	Thr	Pro	Ile	Ser
305					310					315					320
Gln	Ile	Leu	Ser	Asp	Ala	Gly	Tyr	Gln	Phe	Asp	Lys	His	Phe	Pro	Ile
				325					330					335	
Phe	Ala	Gly	Gly	Pro	Met	Met	Gly	Leu	Glu	Leu	Pro	Asn	Leu	Asn	Ala
			340					345					350		
Pro	Val	Thr	Lys	Leu	Val	Asn	Cys	Leu	Leu	Ala	Pro	Asp	Tyr	Leu	Glu
			355				360					365			
Tyr	Ala	Glu	Pro	Glu	Ala	Glu	Gln	Ala	Cys	Ile	Arg	Cys	Ser	Ser	Cys
						375					380				
Ser	Asp	Ala	Cys	Pro	Val	Asn	Leu	Met	Pro	Gln	Gln	Leu	Tyr	Trp	Phe
385					390					395					400
Ala	Arg	Ser	Glu	Asp	His	Lys	Lys	Ser	Glu	Glu	Tyr	Ala	Leu	Lys	Asp
				405					410					415	
Cys	Ile	Glu	Cys	Gly	Ile	Cys	Ala	Tyr	Val	Cys	Pro	Ser	His	Ile	Pro
			420					425					430		
Leu	Ile	Gln	Tyr	Phe	Arg	Gln	Glu	Lys	Ala	Lys	Ile	Trp	Gln	Ile	Lys
			435				440					445			
Glu	Lys	Gln	Lys	Lys	Ser	Asp	Glu	Ala	Lys	Ile	Arg	Phe	Glu	Ala	Lys
						455					460				
Gln	Ala	Arg	Met	Glu	Arg	Glu	Glu	Gln	Glu	Arg	Lys	Ala	Arg	Ser	Gln
465					470					475					480
Arg	Ala	Ala	Gln	Ala	Arg	Arg	Glu	Glu	Leu	Ala	Gln	Thr	Lys	Gly	Glu
				485					490					495	
Asp	Pro	Val	Lys	Ala	Ala	Leu	Glu	Arg	Leu	Lys	Ala	Lys	Lys	Ala	Asn
			500					505					510		
Glu	Thr	Glu	Ser	Thr	Gln	Ile	Lys	Thr	Leu	Thr	Ser	Glu	Lys	Gly	Glu
			515				520					525			
Val	Leu	Pro	Asp	Asn	Thr	Asp	Leu	Met	Ala	Gln	Arg	Lys	Ala	Arg	Arg
					535						540				
Leu	Ala	Arg	Gln	Gln	Ala	Ala	Ser	Gln	Val	Glu	Asn	Gln	Glu	Gln	Gln
545					550					555					560
Thr	Gln	Pro	Thr	Asn	Ala	Lys	Lys	Ala	Ala	Val	Ala	Ala	Ala	Leu	Ala
				565					570					575	
Arg	Ala	Lys	Ala	Lys	Lys	Leu	Ala	Gln	Ala	Asn	Ser	Thr	Ser	Glu	Ala
			580					585					590		

Ile Ser Asn Ser Gln Thr Ala Glu Asn Gln Val Glu Lys Thr Lys Ser  
595 600 605

Ala Val Glu Lys Thr Gln Glu Asn Ser Thr Ala Leu Asp Pro Lys Lys  
610 615 620

Ala Ala Val Ala Ala Ala Ile Ala Arg Ala Lys Ala Lys Lys Leu Ala  
625 630 635 640

Gln Thr Asn Ser Thr Ser Glu Ala Ile Ser Asn Ser Gln Thr Ala Glu  
645 650 655

Asn Glu Val Glu Lys Thr Lys Ser Ala Val Glu Lys Thr Glu Glu Asn  
660 665 670

Ser Thr Ala Leu Asp Ala Lys Lys Ala Ala Ile Ala Ala Ala Ile Ala  
675 680 685

Arg Ala Lys Ala Lys Lys Leu Ala Gln Ala Asn Ser Ala Ser Glu Ala  
690 695 700

Ile Ser Asn Ser Gln Thr Ala Glu Asn Glu Val Glu Lys Thr Lys Ser  
705 710 715 720

Ala Val Glu Lys Thr Gln Gln Asn Ser Thr Ala Leu Asp Pro Lys Lys  
725 730 735

Ala Ala Val Ala Ala Ala Ile Ala Arg Ala Lys Ala Lys Lys Leu Ala  
740 745 750

Gln Ala Asn Ser Thr Ser Glu Ala Ile Ser Asn Ser Gln Thr Ala Glu  
755 760 765

Asn Glu Val Glu Lys Thr Lys Ser Ala Val Glu Lys Thr Gln Glu Asn  
770 775 780

Ser Thr Ala Leu Asp Pro Lys Lys Ala Ala Val Ala Ala Ala Ile Ala  
785 790 795 800

Arg Ala Lys Ala Lys Lys Leu Ala Lys Thr Gln Ala Thr Leu Glu Asn  
805 810 815

Asn Gln Glu

<210> 63  
<211> 52  
<212> PRT  
<213> H. influenzae

<220>  
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<223> predicted coding region HI1562

<220>  
<221> misc\_feature  
<223> gi|1574414

<400> 63

Met Leu Ser Lys Asp Pro Lys Val Leu Ile Lys Leu Gly Glu Leu Glu  
1 5 10 15  
Lys Asp Lys Ser Lys Ala Lys Lys Tyr Phe Gly Asp Ala Cys Asp Leu  
20 25 30  
Arg Ser Gln Glu Gly Cys Asp Lys Tyr Arg Glu Leu Asn Gln Lys Gln  
35 40 45  
Asp Thr Asn Lys  
50

<210> 64  
<211> 150  
<212> PRT  
<213> H. influenzae

<220>  
<221> misc\_feature  
<223> conserved hypothetical protein

<220>  
<221> misc\_feature  
<223> gi|1574625

<400> 64

Met Thr Leu Gln Leu Asn Thr Ile Ala Leu Leu Leu Val Ile Leu Leu  
1 5 10 15  
Ile Leu Gly Val Leu Ser Asn Asn Ser Thr Ile Thr Ile Ser Ala Ala  
20 25 30  
Val Leu Leu Ile Met Gln Gln Thr Phe Leu Ser Ser His Ile Pro Leu  
35 40 45  
Leu Glu Lys Tyr Gly Val Lys Ile Gly Ile Ile Ile Leu Thr Ile Gly  
50 55 60  
Val Leu Ser Pro Leu Val Ser Gly Lys Ile Gln Leu Pro Asp Leu Ser  
65 70 75 80  
Gly Phe Leu Ser Trp Lys Met Ala Leu Ser Ile Ser Val Gly Val Leu  
85 90 95  
Val Ala Trp Leu Ala Gly Lys Gly Val Pro Leu Met Gly Glu Gln Pro

100	105	110
Ile Leu Val Thr Gly Leu Leu	Ile Gly Thr Ile Ile Gly Val Ala Phe	
115	120	125
Leu Gly Gly Ile Pro Val Gly Pro Leu Ile Ala Ala Gly Ile Leu Ala		
130	135	140
Leu Leu Leu Gly Lys Ile		
145	150	

<210> 65  
 <211> 129  
 <212> PRT  
 <213> H. influenzae  
  
 <220>  
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 <223> predicted coding region HI1339

<220>  
 <221> misc\_feature  
 <223> gi|1574799

<400> 65

Met Glu Lys Ile Met Lys Lys Leu Thr Leu Ala Leu Val Leu Gly Ser	
1 5 10 15	
Ala Leu Val Val Thr Gly Cys Phe Asp Lys Gln Glu Ala Lys Gln Lys	
20 25 30	
Val Glu Asp Thr Lys Gln Thr Val Ala Ser Val Ala Ser Glu Thr Lys	
35 40 45	
Asp Ala Ala Ala Asn Thr Met Thr Glu Val Lys Glu Lys Ala Gln Gln	
50 55 60	
Leu Ser Thr Asp Val Lys Asn Lys Val Ala Glu Lys Val Glu Asp Ala	
65 70 75 80	
Lys Glu Val Ile Lys Ser Ala Thr Glu Ala Ala Ser Glu Lys Val Gly	
85 90 95	
Glu Met Lys Glu Ala Ala Ser Glu Lys Ala Ser Glu Met Lys Glu Ala	
100 105 110	
Val Ser Glu Lys Ala Thr Gln Ala Val Asp Ala Val Lys Glu Ala Thr	
115 120 125	
Lys	

<210> 66  
 <211> 136  
 <212> PRT  
 <213> H. influenzae

<220>  
 <221> misc\_feature  
 <223> predicted coding region HI1462.1

<220>  
 <221> misc\_feature  
 <223> "Xaa" may be any amino acid

<220>  
 <221> misc\_feature  
 <223> gi|3212225

<400> 66

Met	Xaa	Gln	Ser	Asn	Tyr	Ser	Met	Glu	Lys	Ile	Met	Lys	Lys	Leu	Thr
1				5					10					15	
Leu	Ala	Leu	Val	Leu	Gly	Ser	Ala	Leu	Val	Val	Thr	Gly	Cys	Phe	Asp
			20					25					30		
Lys	Gln	Glu	Ala	Lys	Gln	Lys	Val	Glu	Asp	Thr	Lys	Gln	Thr	Val	Ala
			35				40					45			
Ser	Val	Ala	Ser	Glu	Thr	Lys	Asp	Ala	Ala	Ala	Asn	Thr	Met	Thr	Glu
			50			55					60				
Val	Lys	Glu	Lys	Ala	Gln	Gln	Leu	Ser	Thr	Asp	Val	Lys	Asn	Lys	Val
65					70					75					80
Ala	Glu	Lys	Val	Glu	Asp	Ala	Lys	Glu	Val	Ile	Lys	Ser	Ala	Thr	Glu
				85					90					95	
Ala	Ala	Ser	Glu	Lys	Val	Gly	Glu	Met	Lys	Glu	Ala	Ala	Ser	Glu	Lys
			100					105					110		
Ala	Ser	Glu	Met	Lys	Glu	Ala	Val	Ser	Glu	Lys	Ala	Thr	Gln	Ala	Val
			115				120					125			
Asp	Ala	Val	Lys	Glu	Ala	Thr	Lys								
			130			135									

<210> 67  
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 <212> PRT  
 <213> H. influenzae

<220>



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<223> conserved hypothetical protein

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<400> 67

Met Phe Thr Asp Trp Lys Glu His Thr Ser His Val Lys Lys Ser Phe  
1 5 10 15  
Gly Glu Leu Gly Lys Gln Tyr Pro Lys Met Leu Gln Ala Tyr Gln Ala  
20 25 30  
Leu Gly Ala Ala Ala Glu Gly Asn Val Leu Asp Ala Lys Thr Arg  
35 40 45  
Glu Leu Ile Ala Leu Ala Val Ala Val Thr Thr Arg Cys Glu Ser Cys  
50 55 60  
Ile Ser Ala His Ala Glu Glu Ala Val Lys Ala Gly Ala Ser Glu Ala  
65 70 75 80  
Glu Val Ala Ala Ala Leu Ala Thr Ala Ile Ala Leu Asn Ala Gly Ala  
85 90 95  
Ala Tyr Thr Tyr Ser Leu Arg Ala Leu Glu Ala Tyr Ser Val Gln Lys  
100 105 110

Ala

<210> 68  
<211> 33  
<212> PRT  
<213> H. pylori

<220>  
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<223> predicted coding region HP0131

<220>  
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<223> gi|2313229

<400> 68

Met Pro Tyr Pro Phe Met Ser Phe Lys Gln Thr Phe Tyr Tyr Lys Met  
1 5 10 15

Glu Ser Lys Thr Met Lys Glu Arg Phe Lys Thr Leu Phe Phe Lys Ile  
 20 25 30

Phe

<210> 69  
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 <212> PRT  
 <213> H. pylori

<220>  
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<220>  
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<400> 69

Met Asn Glu Asn Gly Lys Lys Glu Ala Leu Gln Leu  
 1 5 10

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 <213> H. pylori

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<400> 70

Met Gly Ile Ile Tyr Leu Ile Leu Phe Leu Ile Val Ile Tyr Leu Leu  
 1 5 10 15

Tyr Arg Ile Leu Asp Val Leu Glu Gln Lys  
 20 25

<210> 71  
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<400> 71

Met Lys Asp Tyr Glu Asp Glu Leu Glu Asp Phe Glu Glu Glu Glu Leu  
1 5 10 15

Glu Gly Phe Glu Glu Glu Asp Glu Glu Tyr Gly Asp Tyr Lys Asn Val  
20 25 30

Tyr Asp Asp Asp Asp Tyr Glu Asp Tyr Asn Ser Asp Tyr Glu Glu Glu  
35 40 45

<210> 72  
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<220>  
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<400> 72

Met Cys Ser Asn Ser Ser Ser Leu Lys Ile Tyr Ser Leu Glu Ser Asn  
1 5 10 15

Phe Ser Phe Asn Ser Leu Phe  
20

<210> 73  
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<212> PRT  
<213> M. genitalium

<220>  
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<400> 73



290					295					300					
Phe 305	Gln	Asp	Gly	Ile	Thr 310	Lys	Gln	Asn	Ala	Gln 315	His	Val	Glu	Asp	Lys 320
Leu	Val	Ala	Leu	Asn 325	Lys	Glu	Lys	Asp	Arg 330	Leu	Asn	Thr	Gln	Lys	Glu 335
Ala	Phe	Phe	Asn 340	Leu	Arg	Gln	Ser	Ala 345	Leu	Ile	Asp	Ile	Asn	Lys	Leu 350
Gln	Gln	Glu	Asn 355	Glu	Leu	Phe	Ala 360	Lys	His	Leu	Glu	His 365	Gln	Gln	Asn 370
Glu	Phe 370	Glu	Gln	Lys	Gln	Ser 375	Asp	Ser	Leu	Leu	Lys 380	Leu	Glu	Thr	Glu 385
Tyr 385	Lys	Ala	Leu	Gln 390	His	Lys	Ile	Asn	Glu	Phe 395	Lys	Asn	Glu	Ser	Ala 400
Thr	Lys	Ser	Glu	Glu 405	Leu	Leu	Asn	Gln	Glu 410	Arg	Glu	Leu	Phe	Glu	Lys 415
Arg	Arg	Glu	Ile 420	Asp	Thr	Leu	Leu	Thr 425	Gln	Ala	Ser	Leu	Glu	Tyr	Glu 430
His	Gln	Arg 435	Glu	Ser	Ser	Gln	Leu 440	Leu	Lys	Asp	Lys	Gln 445	Asn	Glu	Val 450
Lys 450	Gln	His	Phe	Gln	Asn	Leu 455	Glu	Tyr	Ala	Lys	Lys 460	Glu	Leu	Asp	Lys 465
Glu 465	Arg	Asn	Leu	Leu	Asp 470	Gln	Gln	Lys	Lys	Val 475	Asp	Ser	Glu	Ala	Ile 480
Phe	Gln	Leu	Lys 485	Glu	Lys	Val	Ala	Gln	Glu 490	Arg	Lys	Glu	Leu	Glu	Glu 495
Leu	Tyr	Leu	Val 500	Lys	Lys	Gln	Lys	Gln	Asp 505	Gln	Lys	Glu	Asn	Glu	Leu 510
Leu	Phe	Phe 515	Glu	Lys	Gln	Leu	Lys	Gln	His	Gln	Ala	Asp 525	Phe	Glu	Asn 530
Glu 530	Leu	Glu	Ala	Lys	Gln	Gln	Glu	Leu	Phe	Glu	Ala 540	Lys	His	Ala	Leu 545
Glu 545	Arg	Ser	Phe	Ile	Lys 550	Leu	Glu	Asp	Lys	Glu 555	Lys	Asp	Leu	Asn	Thr 560
Lys	Ala	Gln	Gln	Ile 565	Ala	Asn	Glu	Phe	Ser 570	Gln	Leu	Lys	Thr	Asp	Lys 575
Ser	Lys	Ser	Ala 580	Asp	Phe	Glu	Leu	Met 585	Leu	Gln	Asn	Glu	Tyr 590	Glu	Asn 595

Leu	Gln	Gln	Glu	Lys	Gln	Lys	Leu	Phe	Gln	Glu	Arg	Thr	Tyr	Phe	Glu
595						600				605					
Arg	Asn	Ala	Ala	Val	Leu	Ser	Asn	Arg	Leu	Gln	Gln	Lys	Arg	Glu	Glu
610						615				620					
Leu	Leu	Gln	Gln	Lys	Glu	Thr	Leu	Asp	Gln	Leu	Thr	Lys	Ser	Phe	Glu
625				630						635				640	
Gln	Glu	Arg	Leu	Ile	Asn	Gln	Arg	Glu	His	Lys	Glu	Leu	Val	Ala	Ser
				645				650						655	
Val	Glu	Lys	Gln	Lys	Glu	Ile	Leu	Gly	Lys	Lys	Leu	Gln	Asp	Phe	Ser
		660						665				670			
Gln	Thr	Ser	Leu	Asn	Ala	Ser	Lys	Asn	Leu	Ala	Glu	Arg	Glu	Met	Ala
		675				680						685			
Ile	Lys	Phe	Lys	Glu	Lys	Glu	Ile	Glu	Ala	Thr	Glu	Lys	Gln	Leu	Leu
690						695				700					
Asn	Asp	Val	Asn	Asn	Ala	Glu	Val	Ile	Gln	Ala	Asp	Leu	Ala	Gln	Leu
705				710						715				720	
Asn	Gln	Ser	Leu	Asn	Gln	Glu	Arg	Ser	Glu	Leu	Gln	Asn	Ala	Lys	Gln
				725				730						735	
Arg	Ile	Ala	Asp	Phe	His	Asn	Asp	Ser	Leu	Lys	Lys	Leu	Asn	Glu	Tyr
		740				745						750			
Glu	Leu	Ser	Leu	Gln	Lys	Arg	Leu	Gln	Glu	Leu	Gln	Thr	Leu	Glu	Ala
		755				760						765			
Asn	Gln	Lys	Gln	His	Ser	Tyr	Gln	Asn	Gln	Ala	Tyr	Phe	Glu	Gly	Glu
770						775				780					
Leu	Asp	Lys	Leu	Asn	Arg	Glu	Lys	Gln	Ala	Phe	Leu	Asn	Leu	Arg	Lys
785				790						795				800	
Lys	Gln	Thr	Met	Glu	Val	Asp	Ala	Ile	Lys	Gln	Arg	Leu	Ser	Asp	Lys
				805				810						815	
His	Gln	Ala	Leu	Asn	Met	Gln	Gln	Ala	Glu	Leu	Asp	Arg	Lys	Thr	His
		820				825						830			
Glu	Leu	Asn	Asn	Ala	Phe	Leu	Asn	His	Asp	Ala	Asp	Gln	Lys	Ser	Leu
		835				840						845			
Gln	Asp	Gln	Leu	Ala	Thr	Val	Lys	Glu	Thr	Gln	Lys	Leu	Ile	Asp	Leu
850						855				860					
Glu	Arg	Ser	Ala	Leu	Leu	Glu	Lys	Gln	Arg	Glu	Phe	Ala	Glu	Asn	Val
865				870						875				880	

Ala Gly Phe Lys Arg His Trp Ser Asn Lys Thr Ser Gln Leu Gln Lys  
885 890 895

Ile Tyr Glu Leu Thr Lys Lys Gln Glu Ser Glu Gln Thr Gln Lys Glu  
900 905 910

Thr Glu Leu Lys Ile Ala Phe Ser Asp Leu Gln Lys Asp Tyr Gln Val  
915 920 925

Phe Glu Leu Gln Lys Asp Gln Glu Phe Arg Gln Ile Glu Ala Lys Gln  
930 935 940

Arg Glu Leu Asp Lys Leu Ala Glu Lys Asn Asn Gln Val Lys Leu Glu  
945 950 955 960

Leu Asp Asn Arg Phe Gln Ala Leu Gln Asn Gln Lys Gln Asp Thr Val  
965 970 975

Gln Ala Gln Leu Glu Leu Glu Arg Glu Gln His Gln Leu Asn Leu Glu  
980 985 990

Gln Thr Ala Phe Asn Gln Ala Asn Glu Ser Leu Leu Lys Gln Arg Glu  
995 1000 1005

Gln Leu Thr Lys Lys Ile Gln Ala Phe His Tyr Glu Leu Lys Lys  
1010 1015 1020

Arg Asn Gln Phe Leu Ala Leu Lys Gly Lys Arg Leu Phe Ala Lys  
1025 1030 1035

Glu Gln Asp Gln Gln Arg Lys Asp Gln Glu Ile Asn Trp Arg Phe  
1040 1045 1050

Lys Gln Phe Glu Lys Glu Tyr Thr Asp Phe Asp Glu Ala Lys Lys  
1055 1060 1065

Arg Glu Leu Glu Glu Leu Glu Lys Ile Arg Arg Ser Leu Ser Gln  
1070 1075 1080

Ser Asn Val Glu Leu Glu Arg Lys Arg Glu Lys Leu Ala Thr Asp  
1085 1090 1095

Phe Thr Asn Leu Asn Lys Val Gln His Asn Thr Gln Ile Asn Arg  
1100 1105 1110

Asp Gln Leu Asn Ser Gln Ile Arg Gln Phe Leu Leu Glu Arg Lys  
1115 1120 1125

Asn Phe Gln Arg Phe Ser Asn Glu Ala Asn Ala Lys Lys Ala Phe  
1130 1135 1140

Leu Ile Lys Arg Leu Arg Ser Phe Ala Ser Asn Leu Lys Leu Gln  
1145 1150 1155

Lys Glu Ala Leu Ala Ile Gln Lys Leu Glu Phe Asp Lys Arg Asp

1160					1165					1170				
Glu	Gln	Gln	Lys	Lys	Glu	Leu	Gln	Gln	Ala	Thr	Leu	Gln	Leu	Glu
					1180					1185				
Gln	Phe	Lys	Phe	Glu	Lys	Gln	Asn	Phe	Asp	Ile	Glu	Lys	Gln	Arg
					1195					1200				
Gln	Leu	Val	Ala	Ile	Lys	Thr	Gln	Cys	Glu	Lys	Leu	Ser	Asp	Glu
					1210					1215				
Lys	Lys	Ala	Leu	Asn	Gln	Lys	Leu	Val	Glu	Leu	Lys	Asn	Leu	Ser
					1225					1230				
Gln	Thr	Tyr	Leu	Ala	Asn	Lys	Asn	Lys	Ala	Glu	Tyr	Ser	Gln	Gln
					1240					1245				
Gln	Leu	Gln	Gln	Lys	Tyr	Thr	Asn	Leu	Leu	Asp	Leu	Lys	Glu	Asn
					1255					1260				
Leu	Glu	Arg	Thr	Lys	Asp	Gln	Leu	Asp	Lys	Lys	His	Arg	Ser	Ile
					1270					1275				
Phe	Ala	Arg	Leu	Thr	Lys	Phe	Ala	Asn	Asp	Leu	Arg	Phe	Glu	Lys
					1285					1290				
Lys	Gln	Leu	Leu	Lys	Ala	Gln	Arg	Ile	Val	Asp	Asp	Lys	Asn	Arg
					1300					1305				
Leu	Leu	Lys	Glu	Asn	Glu	Arg	Asn	Leu	His	Phe	Leu	Ser	Asn	Glu
					1315					1320				
Thr	Glu	Arg	Lys	Arg	Ala	Val	Leu	Glu	Asp	Gln	Ile	Ser	Tyr	Phe
					1330					1335				
Glu	Lys	Gln	Arg	Lys	Gln	Ala	Thr	Asp	Ala	Ile	Leu	Ala	Ser	His
					1345					1350				
Lys	Glu	Val	Lys	Lys	Lys	Glu	Gly	Glu	Leu	Gln	Lys	Leu	Leu	Val
					1360					1365				
Glu	Leu	Glu	Thr	Arg	Lys	Thr	Lys	Leu	Asn	Asn	Asp	Phe	Ala	Lys
					1375					1380				
Phe	Ser	Arg	Gln	Arg	Glu	Glu	Phe	Glu	Asn	Gln	Arg	Leu	Lys	Leu
					1390					1395				
Leu	Glu	Leu	Gln	Lys	Thr	Leu	Gln	Thr	Gln	Thr	Asn	Ser	Asn	Asn
					1405					1410				
Phe	Lys	Thr	Lys	Ala	Ile	Gln	Glu	Ile	Glu	Asn	Ser	Tyr	Lys	Arg
					1420					1425				
Gly	Met	Glu	Glu	Leu	Asn	Phe	Gln	Lys	Lys	Glu	Phe	Asp	Lys	Asn
					1435					1440				



Lys	Ser	Arg	Leu	Tyr	Glu	Tyr	Phe	Arg	Lys	Met	Arg	Asp	Glu	Ile
1445	1445					1450					1455			
Glu	Arg	Lys	Glu	Ser	Gln	Val	Lys	Leu	Val	Leu	Lys	Glu	Thr	Gln
1460	1460					1465					1470			
Arg	Lys	Ala	Asn	Leu	Leu	Glu	Ala	Gln	Ala	Asn	Lys	Leu	Asn	Ile
1475	1475					1480					1485			
Glu	Lys	Asn	Thr	Ile	Asp	Phe	Lys	Glu	Lys	Glu	Leu	Lys	Ala	Phe
1490	1490					1495					1500			
Lys	Asp	Lys	Val	Asp	Gln	Asp	Ile	Asp	Ser	Thr	Asn	Lys	Gln	Arg
1505	1505					1510					1515			
Lys	Glu	Leu	Asn	Glu	Leu	Leu	Asn	Glu	Asn	Lys	Leu	Leu	Gln	Gln
1520	1520					1525					1530			
Ser	Leu	Ile	Glu	Arg	Glu	Arg	Ala	Ile	Asn	Ser	Lys	Asp	Ser	Leu
1535	1535					1540					1545			
Leu	Asn	Lys	Lys	Ile	Glu	Thr	Ile	Lys	Arg	Gln	Leu	His	Asp	Lys
1550	1550					1555					1560			
Glu	Met	Arg	Val	Leu	Arg	Leu	Val	Asp	Arg	Met	Lys	Leu	Ala	Glu
1565	1565					1570					1575			
Gln	Lys	Tyr	Gln	Thr	Glu	Ile	Asn	Arg	Leu	Arg	Thr	Gln	Thr	Phe
1580	1580					1585					1590			
Asp	Ser	Glu	Lys	Gln	Asp	Ile	Lys	Asn	Phe	Phe	Pro	Pro	Leu	Phe
1595	1595					1600					1605			
Lys	Ile	Asn	Gly	Asn	Asp	Met	Ala	Phe	Pro	Tyr	Leu	Tyr	Pro	Trp
1610	1610					1615					1620			
Leu	Tyr	Pro	Gln	Gln	Lys	Gln	Asp	Asp	Asn	Thr	Leu	Gln	Ile	Arg
1625	1625					1630					1635			
Gln	Leu	Phe	Glu	Gln	Gln	Leu	Gln	Phe	Met	Gln	Gln	Arg	Tyr	Glu
1640	1640					1645					1650			
Asn	Glu	Leu	Asn	Glu	Leu	Arg	Arg	Gln	Arg	Asn	Leu	Leu	Glu	Lys
1655	1655					1660					1665			
Lys	Leu	Asp	Gln	Ile	Gln	Leu	Glu	Ser	Gln	Leu	Asn	Asn	Lys	Gln
1670	1670					1675					1680			
Ser	Glu	Phe	Ser	Lys	Val	Glu	Ser	Met	Met	Glu	Lys	Leu	Leu	Glu
1685	1685					1690					1695			
Lys	Thr	Glu	Ser	Arg	Leu	Asn	Asp	Phe	Asp	Gln	Lys	Ile	Asn	Tyr
1700	1700					1705					1710			

Leu Thr Lys Lys Val Asn Gln His Asn Thr Tyr Gln Pro Ser Ser  
 1715 1720 1725  
 Tyr Gln Pro Thr Pro Ser Tyr Gln Asp Ser Asp Lys Gln Gln Leu  
 1730 1735 1740  
 Leu Phe Arg Ile Gln Glu Leu Glu Lys Gln Asn Leu Phe Gln Gln  
 1745 1750 1755  
 Gln Phe Gln Pro Ala Pro Ala Val Val Gln Gln Pro Thr Ser Phe  
 1760 1765 1770  
 Ala Ala Pro Asn Ile Thr Lys Gln Gln Gln Ile Ala Gln Leu Asn  
 1775 1780 1785  
 Ala Glu Ile Asn Asn Ile Lys Arg Leu Ile Ala Gln Lys Ala Ala  
 1790 1795 1800  
 Ser Lys  
 1805

<210> 74  
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 <212> PRT  
 <213> M. genitalium

<220>  
 <221> misc\_feature  
 <223> hypothetical protein

<220>  
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<400> 74

Met Gln Tyr Ser Ala Leu Ile Pro Leu Phe Ile Leu Leu Ile Ser Leu  
 1 5 10 15  
 Val Leu Phe Cys Phe Ser Phe Arg Lys Asn Gln Ser Glu Asn Gln Ile  
 20 25 30  
 Val Lys Ile Leu Phe Phe Ala Tyr Cys Ile Asp Phe Leu Ala Leu Ile  
 35 40 45  
 Leu Ala Val Met Leu Leu Thr Phe Leu Ser His Gly Leu Leu Ser Leu  
 50 55 60  
 Ala Ile Leu Ile Pro Val Leu Val Phe Gln  
 65 70

<210> 75  
 <211> 1033



210				215				220							
Phe 225	Ala	Leu	Asp	Gln	Thr	Gln	Leu	Val	Asp	Glu	Leu	Val	Thr	Val	Pro 240
				230				235							
Leu	Thr	His	Thr	Leu	Val	Asn	Glu	Ser	Ala	Pro	Val	Thr	Pro	Val	Val
				245				250				255			
Val	Thr	Ser	Pro	Ala	Ala	Glu	His	Ser	Phe	Ser	Ile	Thr	Thr	Val	Asp
				260				265				270			
Lys	Ala	Asn	Leu	Thr	Asn	Ala	Leu	Ser	Gln	Thr	Val	Val	Ile	Lys	Pro
				275				280				285			
Ala	Glu	Asp	Ser	Ala	His	Gln	Ser	Ala	Val	Leu	Asp	Lys	Glu	Ile	Ala
				290				295				300			
Thr	Lys	Gln	Ala	Gln	Leu	Gln	Gln	Leu	Gln	Ala	Gln	Ile	Glu	Leu	Arg
				305				310				315			
Gln	Ala	Gln	Leu	Glu	Thr	Pro	Pro	Val	Thr	Tyr	Met	Gly	Val	Glu	Glu
				320				325				330			
Tyr	Lys	Leu	Leu	Pro	Val	Gln	Asp	Val	Val	Pro	Val	Gln	Pro	Thr	Val
				335				340				345			
Ser	Phe	Glu	Met	Thr	Leu	Leu	Gln	Glu	Gln	Leu	Asp	Lys	Ala	Leu	Lys
				350				355				360			
His	Asn	Ala	Ala	Leu	Gln	Ile	Gln	Leu	Glu	Glu	Gln	Leu	Ala	Lys	Pro
				365				370				375			
Leu	Gln	Tyr	Asp	Gln	Ser	Pro	Val	Leu	Gln	Glu	Arg	Ile	Glu	Leu	Leu
				380				385				390			
Gln	Asn	Gln	Asn	Thr	Asn	Leu	Thr	Gln	Glu	Leu	Asn	Glu	Leu	Gln	Gln
				395				400				405			
Lys	Leu	Phe	Lys	Ser	Gln	Asn	Asn	Ser	Leu	Leu	Leu	Ala	Arg	Leu	Glu
				410				415				420			
Glu	Glu	Asn	Arg	Thr	Leu	Lys	Gln	His	Leu	Gln	Asn	Asn	Leu	Pro	Glu
				425				430				435			
Ala	Asn	Gln	Leu	Asn	Phe	Val	Leu	Glu	Lys	Gln	Leu	Glu	Gln	Leu	Gln
				440				445				450			
Gln	Asp	Lys	His	Ser	Leu	Thr	Leu	Gln	Ile	Glu	Gln	Tyr	Lys	Phe	Asp
				455				460				465			
Ser	Lys	Lys	His	Gln	Glu	Gln	Leu	Ala	Leu	Ile	Pro	Ser	Leu	Arg	Ser
				470				475				480			
Glu	Ile	Asn	Ser	Leu	Glu	Thr	Glu	Val	Ile	Ser	Leu	Lys	Gln	Thr	Asn
				485				490				495			
				500				505				510			

Gln Arg Leu Ser Leu Ile Glu Arg Glu Asn Asn Phe Leu Lys Thr Glu	515	520	525
Ile Lys Gln Leu Arg Glu Thr Lys Leu Asn Asp Glu Asn Thr Lys Tyr	530	535	540
Arg Asn Leu Leu Lys Gln Tyr Glu Leu Met Arg Ala Asp Ser Asp Ala	545	550	555 560
Lys Leu Lys Glu Leu Glu His Glu Gln His Leu Ala His Gln His His	565	570	575
Gln Glu Gln Leu Ala Gln Leu Gln Arg His Asn Glu Ala Leu Val Lys	580	585	590
Glu Leu Asp Gln Val Lys Ala Thr Asn Phe Glu Leu Gly Leu Ala Ala	595	600	605
Gln Gly Phe Glu Gln Gln Lys Val Val Leu Glu Gln Lys Asn Ser Ser	610	615	620
Leu Leu Ala Ser Leu Gln Ala Ala Glu Glu Asn Val Gln Ala Leu Gly	625	630	635 640
Ile Thr Asn Ser Glu Leu Gln Asn Gln Leu Asn Val Leu Glu Phe Thr	645	650	655
His Lys Glu Lys Thr Ala Phe Asp Ser Lys Thr Leu Thr Leu Thr Lys	660	665	670
Gln Gln Leu Glu Gln Thr Gln Phe Asp Leu Ser Leu Thr Gln Glu Gln	675	680	685
Leu Ala Thr Phe Lys Gln Gln Asn Gln Ser Leu Thr Asp Lys Leu Met	690	695	700
Ala Ser Glu Thr Gln Leu Asn His Leu Gln Gln Ser Asp Glu Asn Leu	705	710	715 720
Thr Gln Leu Gln Thr Gln His Glu Leu Leu Gln Glu Ser Tyr Asn Lys	725	730	735
Leu Gln Asp Glu Ala Asn His Thr Gln Gln Gln Phe His Gln Ala Gln	740	745	750
Asn Glu Leu Asp Ala Ala His Gln Gln Leu Ala Leu Phe Lys Gln Asn	755	760	765
Asn Glu Glu Leu Thr Asp Lys Cys Ser Asn Ile Gln Asn Glu Leu His	770	775	780
Asp Leu Asn Arg Val Lys Thr Asn Trp Glu Asn Leu Asn Thr Glu His	785	790	795 800

Asn Leu Leu Gln Asp Lys Tyr Ala Gln Gln Lys Glu Gln Met Gln His  
 805 810 815  
 Glu His Ser Asn Leu Ala Gln Ile Gln Ala Glu His Glu Leu Leu Gln  
 820 825 830  
 Glu Ser Tyr Asn Lys Val Lys Ala Glu Leu Asn Glu Ile Gln Ile Thr  
 835 840 845  
 Asn Leu Asn Glu Ala Asn Ala Gln Tyr Gln Asp Leu Leu Ser Ala Tyr  
 850 855 860  
 Glu Leu Leu Gln Ser Asn His Asn Lys Leu Lys Gln Glu Leu Gln Val  
 865 870 875 880  
 Leu Asn Gln Val Asn Leu Glu Lys Gln Gln Leu Ala Gln Lys Leu His  
 885 890 895  
 Asn Thr His Gln Ser Leu Ser Gln Thr His Ala Glu Leu Thr Gln Leu  
 900 905 910  
 Gln Ala Ala Tyr Asn Asn Leu Gln Ala Thr Pro Pro Val Ser Asp Glu  
 915 920 925  
 Leu Leu Glu Gln Phe Asn Gln Val Gln Leu Glu Lys Gln Arg Leu Leu  
 930 935 940  
 Gln Gln Asn Leu Ala Leu Val His Glu Leu Gln Tyr Phe Asn Glu Leu  
 945 950 955 960  
 Asn Ser Ser Gln Thr His Glu Ile Lys Thr Lys Gln Asp Glu Thr Val  
 965 970 975  
 Lys Glu Val Ile Ile Val Glu Lys Glu Ile Pro Val Pro Pro Glu Lys  
 980 985 990  
 Lys Pro Arg Leu Lys Lys Arg Asp Ile Val Ile Glu Asn Lys Glu Asp  
 995 1000 1005  
 Ala Leu Gly Lys Leu Ser Lys Lys Glu Arg Ile Gln Ala Tyr Ala  
 1010 1015 1020  
 Glu Arg Leu Ala Lys Ile Asn Gly Lys Gln  
 1025 1030

<210> 76  
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 <223> A05\_orf139 Protein

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<223> gi|1673719

<400> 76

Met Arg Trp Cys Arg Gly Ser Pro Tyr His Trp Asn Leu Asp Arg Arg  
1 5 10 15

Asn Pro Asp Phe Pro Ala  
20

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<211> 103  
<212> PRT  
<213> M. pneumoniae

<220>  
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<400> 77

Met Ser Ser Val Phe Ser Lys Pro Asn Leu Lys Arg Pro Ser Phe Asp  
1 5 10 15

Val Lys Asn Leu Thr Lys Pro Ser Arg Leu Leu Ser Ala Thr Leu Arg  
20 25 30

Ser Ser Cys Ala Phe Leu Ser Ser Ala Ser Phe Phe Ala Cys Ser Leu  
35 40 45

Cys Phe Phe Cys Cys Ser Ser Ile Ser Phe Cys Ser Leu Ala Ser Ser  
50 55 60

Ser Ala Arg Leu Arg Tyr Ser Ser Ser His Ser Phe Phe Cys Trp Val  
65 70 75 80

Leu Phe Ser Arg Ser Gly Leu Ala Tyr Ser Ser Ser Asn Leu Ser Ser  
85 90 95

Lys Ser Ser Arg Leu Arg Ser  
100

<210> 78  
<211> 112  
<212> PRT  
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<220>  
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<220>  
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 <223> gi|1674374

<400> 78

Met	Ile	Asp	Arg	Phe	Phe	Trp	Ser	Ile	Leu	Ser	Phe	Leu	Leu	Thr	Asn
1				5					10					15	
Leu	Val	Phe	Leu	Phe	Val	Ala	Phe	Leu	Ile	Leu	Ile	Ile	Tyr	Leu	Ile
		20						25					30		
Ser	Glu	Ile	Thr	Gln	Gln	Phe	Ala	Phe	Ala	Phe	Ile	Ala	Thr	Ile	Val
		35				40						45			
Phe	Ile	Ile	Phe	Tyr	Asn	Ile	Leu	Phe	Leu	Ser	Tyr	Leu	Leu	Thr	Met
	50				55						60				
Tyr	Ile	Lys	Gly	Leu	Lys	Gln	Ile	Glu	Gln	Lys	Ser	Arg	Tyr	Leu	Leu
65				70						75				80	
Leu	Val	Leu	Asp	Val	Lys	Ala	Asp	Glu	Leu	Leu	Pro	Phe	Ser	Phe	Leu
			85						90					95	
Gly	Ser	Leu	Arg	Lys	Ser	His	Met	Leu	Glu	Glu	Met	Leu	Leu	Glu	Gln
			100					105						110	

<210> 79  
 <211> 147  
 <212> PRT  
 <213> M. pneumoniae

<220>  
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 <223> B01\_orf147 Protein

<220>  
 <221> misc\_feature  
 <223> gi|1673775

<400> 79

Met	Pro	Ser	Ser	Ala	Phe	Lys	Ile	Asn	Leu	Ser	Val	Ser	Pro	Trp	Phe
1				5					10					15	
Phe	Cys	Ser	Thr	Trp	Ser	Ser	Leu	Ile	Cys	Trp	Pro	Trp	Thr	Ile	Thr



20	25	30
Thr Ser Val Ser Arg Ser Thr Leu Ser Ser Thr Thr Trp Ile Leu Trp		
35	40	45
Thr Trp Leu Phe Asn Ser Val Ser Ile Phe Val Ser Arg Trp Ser Phe		
50	55	60
Asp Phe Leu Tyr Ser Leu Asn Ser Leu Arg Val Thr Tyr Ser Val Phe		
65	70	75
Thr Gly Ile Thr Gly Leu Leu Ser Leu Asn Cys Leu Leu Lys Leu Pro		
	85	90
Glu Asn Ser Thr Leu Leu Leu Ser Leu Ser Ile Ile Tyr Gln Pro Glu		
	100	105
Lys Val Pro Phe Trp Ser Phe Ser Pro Cys His Glu Ile Leu Phe Arg		
	115	120
Tyr Lys Thr Glu Phe Ser Leu Ser Leu Ser His Thr Ser Phe Leu Phe		
	130	135
Ser Glu Ile		
145		
<210> 80		
<211> 217		
<212> PRT		
<213> M. tuberculosis		
<220>		
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<223> hypothetical protein Rv3611		
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<223> gi 2113965		
<400> 80		
Met Ala Ile Ala Asn Pro Ala Glu Pro Gly Ala Ala Gly Arg His His		
1	5	10
Gln Pro Arg Gly Asp Arg Lys Pro Arg Ala Trp Arg Gln Cys Gly Pro		
	20	30
Gln Asn Gly Pro Arg Arg Ser Gln Ala Ile Thr Pro Glu Pro Gly Ala		
	35	45
Ala Gly Arg His His Gln Pro Arg Gly Asp Arg Lys Pro Arg Ala Trp		
	50	60

Arg Gln Cys Gly Pro Gln Asn Gly Pro Arg Arg Ser Gln Ala Ile Thr  
65 70 75 80

Pro Glu Pro Gly Ala Ala Gly Arg His His Gln Pro Arg Gly Asp Arg  
85 90 95

Lys Pro Arg Ala Trp Arg Gln Cys Gly Pro Gln Asn Gly Pro Arg Arg  
100 105 110

Ser Gln Ala Ile Thr Pro Glu Pro Gly Ala Ala Gly Arg His His Gln  
115 120 125

Pro Arg Gly Asp Arg Lys Pro Arg Ala Trp Arg Gln Cys Gly Pro Gln  
130 135 140

Asn Gly Pro Arg Arg Ser Gln Ala Ile Thr Pro Glu Pro Gly Ala Ala  
145 150 155 160

Gly Arg His His Gln Pro Arg Gly Asp Arg Lys Pro Arg Ala Trp Arg  
165 170 175

Gln Cys Gly Pro Gln Asn Gly Pro Arg Arg Ser Gln Ala Ile Thr Pro  
180 185 190

Glu Pro Gly Ala Ala Gly Arg His Trp Leu Asp Gln Arg Pro Val Val  
195 200 205

Pro Asp Gly Val Gly Lys Ser Asp Ser  
210 215

<210> 81  
<211> 27  
<212> PRT  
<213> M. tuberculosis

<220>  
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<223> hypothetical protein Rv1572c

<220>  
<221> misc\_feature  
<223> gi|2117265

<400> 81

His Gly Gln Pro Arg Thr Asn Thr Phe His His His Glu Lys Leu Leu  
1 5 10 15

Arg His Asn Asp Glu Asp Asn His Asp Asp Pro  
20 25

<210> 82  
<211> 73

<212> PRT  
 <213> M. tuberculosis  
 <220>  
 <221> misc\_feature  
 <223> hypothetical protein Rv0378

<220>  
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 <223> gi|2909499

<400> 82

Met Ser Gly Arg Trp Glu Ala Gly Asn Ala Asp Gly Asn Gly Gly Ser  
 1 5 10 15

Ala Gly Leu Ile Gly Ser Gly Gly Ala Gly Gly Asp Gly Gly Ser Gly  
 20 25 30

Gly Ala Thr Gly Ala Gly Gly Glu Gly Gly Asp Ala Gly Ala Ser Gly  
 35 40 45

Ser Ile Asn Gly Asn Ala Gly Asp Pro Gly Asn Ser Gly Glu Arg Gly  
 50 55 60

Ala Val Gly Lys Pro Gly Ala Pro Gly  
 65 70

<210> 83  
 <211> 47  
 <212> PRT  
 <213> N. meningitis MC58

<220>  
 <221> misc\_feature  
 <223> hypothetical protein

<220>  
 <221> misc\_feature  
 <223> gi|7225315

<400> 83

Met Glu Trp Ala Glu Asn Glu Thr Val Lys Leu Ala Gln Lys Trp Glu  
 1 5 10 15

Gln Glu Gln Lys Lys Gln Gln Ile Gln Gln Lys Lys Glu Thr Glu Lys  
 20 25 30

Ser Pro Lys His Lys Ala Ser Arg Asp Asp Trp Glu Met Glu Arg  
 35 40 45

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Met Lys Lys Ser Leu Phe Ala Ala Ala Leu Leu Ser Leu Val Leu Ala  
1 5 10 15  
Ala Cys Gly Gly Glu Lys Ala Ala Glu Ala Pro Ala Ala Glu Ala Pro  
20 25 30  
Ala Ala Glu Ala Pro Ala Thr Glu Ala Pro Ala Ala Glu Ala Pro Ala  
35 40 45  
Ala Glu Ala Pro Ala Ala Glu Ala Pro Ala Ala Glu Ala Ala Ala Thr  
50 55 60  
Glu Ala Pro Ala Ala Glu Ala Ala Ala Thr Glu Ala Pro Ala Ala Glu  
65 70 75 80  
Ala Ala Ala Thr Glu Ala Pro Ala Ala Glu Ala Pro Ala Ala Glu Ala  
85 90 95

Ala Lys

<210> 86  
<211> 34  
<212> PRT  
<213> N. meningitis MC58  
<220>  
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<220>  
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<400> 86

Met Pro Trp Lys Ile Ser Thr Thr Thr Asn Leu Thr Pro Val Pro Ser  
1 5 10 15  
Ala Asn Leu Ser Ala Leu Pro Thr Thr Arg Cys Thr Thr Pro Pro Pro  
20 25 30

Thr Pro

<210> 87  
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<212> PRT  
<213> N. meningitis MC58

<220>  
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<223> hypothetical protein

<220>

<221> misc\_feature

<223> gi|7227104

<400> 87

Met Gly Ile Pro Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly Ile Pro  
1 5 10 15

Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly  
20 25 30

Ile Pro Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly Ile Pro Glu Ser  
35 40 45

Ser Gly Ile Pro Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly Ile Pro  
50 55 60

Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly  
65 70 75 80

Ile Pro Glu Ser Ser Gly Ile Pro Glu Ser Ser Gly Ile Pro Glu Pro  
85 90 95

Ser Phe Pro Arg Arg Arg Glu Ser Arg Pro Val Gly Ala Glu Thr Tyr  
100 105 110

Arg Val

<210> 88

<211> 120

<212> PRT

<213> N. meningitis MC58

<220>

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<223> hypothetical protein

<220>

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<223> gi|7226645

<400> 88

Met Ile Ala Lys Ser Leu Phe Phe Arg Cys Gln Lys Ile Tyr Phe Ile  
1 5 10 15

Tyr Phe Ile Leu Phe Ile Cys Leu Tyr Leu Asn Ile Ser Tyr Asp Gly







Gln Leu Gln Arg Gln Gln Gln Asn Leu Gln Arg Gln Arg Gln Gln Arg  
65 70 75 80

Gln Met Gln Asp Asn Leu Ile Arg Gln Gln Gln Leu Asp Gln Gln Arg  
85 90 95

Trp Arg Leu Glu Gln Asp Gln Arg Arg Leu Asp Ser Glu Arg Arg Gln  
100 105 110

Leu Glu Asn Arg Arg Arg Gln Ser Gln Ser Pro Ala Ile Arg  
115 120 125

<210> 92

<211> 101

<212> PRT

<213> Pseudomonas aeruginosa

<220>

<221> misc\_feature

<223> AE004643\_2 hypothetical protein

<220>

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<223> gi|9948180

<400> 92

Met Ser Ala Asp Glu Lys Arg Ile Arg Glu Phe Ala Tyr Gln Ile Trp  
1 5 10 15

Glu Ser Glu Gly Cys Pro Asp Gly Gln Ala Glu Arg His Trp Ala Met  
20 25 30

Ala Arg Gln Leu Ala Glu Ala Glu Ala Ala Ala Ala Pro Lys Lys  
35 40 45

Thr Arg Gly Arg Ala Lys Ala Ala Lys Glu Thr Pro Ala Leu Leu Gln  
50 55 60

Ala Pro Ala Ala Lys Pro Arg Lys Pro Arg Ala Ala Ser Pro Ala Arg  
65 70 75 80

Pro Ala Ser Glu Lys Pro Ala Ala Ala Lys Pro Arg Ser Arg Arg Lys  
85 90 95

Pro Glu Ala Gly Glu  
100

<210> 93

<211> 521

<212> PRT

<213> R. prowazekii

<220>  
<221> misc\_feature  
<223> unknown

<220>  
<221> misc\_feature  
<223> gi|3860652

<400> 93

Met Lys Lys Glu Ile Leu Ser Lys Gln Gly Asn Ile Leu Glu Gln Leu  
1 5 10 15

Lys Phe Ile Asn Ala Asn Thr Glu Ile Leu Thr Glu His Ser Lys Ala  
20 25 30

Ile Leu Lys Asp Lys Leu Lys Glu Leu Ser Lys Gln Leu Asp Glu Ile  
35 40 45

Ser Ser Asn Lys Leu Val Gly Phe Ile Leu Asp Glu Asn Lys Ile Asn  
50 55 60

Thr Asn Phe Lys Asn Val Pro Phe Ser Glu Lys Lys Val Arg Glu Gln  
65 70 75 80

Val Asn Asn Leu Asn Asn Lys Ile Leu Glu Lys Ile Phe Leu Lys Asp  
85 90 95

Asp Gly Thr Ile Thr Glu Gln Asp Leu Thr Lys Ile Leu Gln Lys His  
100 105 110

Lys Glu Thr Val Leu Ile Lys Asn Leu Thr Lys Ala Ile Val Tyr Ile  
115 120 125

Asp Gly Asn Lys Asn Asn Glu Thr Val Asn Lys Thr Leu Glu Lys Cys  
130 135 140

Leu Glu Glu Thr Thr Pro Glu Gln Gln Gly Met Ile Leu Asp Val Leu  
145 150 155 160

Thr Asn Asn Thr Arg Ile Arg Lys Ala Leu Ile Thr Lys Ile Glu Arg  
165 170 175

Glu Gln Arg Gln Glu His Asn Gln Lys Leu Asn Lys Asn Ile Ala Gly  
180 185 190

Asp Thr Phe Val Asp Ala Leu Lys Lys Ala Leu Val His Arg Thr Ser  
195 200 205

Asn Pro Glu Thr Ile Gln Lys Ser Leu Glu Arg Arg Lys Lys Glu Thr  
210 215 220

Pro Lys Asn Leu Asn Val Trp Asp Arg Ile Ser Gln Asn Ile Pro Asn

225		230		235		240
Leu Asn Asn Gln Asn Asp Asn Gln Asn Gly Gln Asp Glu Asn Asn Lys						
	245			250		255
Glu Trp Glu Glu Ser Asn Gln Asn Ala Asp Tyr Leu Asn Asn Thr Asn						
	260			265		270
Ile Tyr Arg Ile Thr Lys Ala Lys Gln Asp Leu Glu Lys Ala Val Lys						
	275			280		285
Glu Thr Ile Asn Lys Phe Ser Ala Met Ser Thr Leu Ile Lys Asp Asn						
	290			295		300
Thr Ile Lys Asn Thr Met Ala Tyr Gln Lys Tyr Leu Lys Gly Ala Glu						
305		310		315		320
Asp Gln Leu Ala Leu Ala Lys Glu Lys Gly Lys Glu Leu Ile Glu Asn						
	325			330		335
Ser Val Gln Thr Phe Lys Ile Ile Pro Lys Lys Tyr Gln Asp Asp Met						
	340			345		350
Asn Glu Asn Trp Gln Asn Tyr Leu Ser Pro Glu Glu Ile Ile Glu Leu						
	355			360		365
Thr Ala Leu Asn Glu His Thr Asn Thr Leu Thr Ser Asn Lys Asn Lys						
	370			375		380
Ser Gly Tyr Phe Thr Ser Thr Ala Glu Ala Leu Gln Cys Lys Thr Lys						
385		390		395		400
Gln Gln Glu Tyr Tyr Thr Leu Leu Ser Lys Leu Lys Lys Ile Gly Ile						
	405			410		415
Glu Lys Gln Gln Lys Lys Leu Val Lys Asp Tyr Val Asp Glu Met Ile						
	420			425		430
Thr Asn Ala Lys Gln Ala Val Lys Lys Ile Glu Arg Thr Leu Glu Lys						
	435			440		445
Val Asn Gln Lys Lys Glu Asn Lys Tyr Glu Phe Ser Glu Ser Ser Ala						
	450			455		460
Leu Ile Ser Lys Glu Ile Leu Asp Ala Gln Ala Arg Leu Glu Asn Ala						
465		470		475		480
Lys Gln Lys Ile Glu Phe Ile Lys Leu Lys Gln Ile Ile Ser Asp Lys						
	485			490		495
Arg Gln Val Asn Ser Ser Asp Glu Asp Ser Asp Asp Asp Ser Lys Lys						
	500			505		510
Lys Cys Asn Gln Thr Lys Ser Arg Thr						
	515			520		

<210> 94  
 <211> 143  
 <212> PRT  
 <213> R. prowazekii

<220>  
 <221> misc\_feature  
 <223> unknown

<220>  
 <221> misc\_feature  
 <223> gi|3860651

<400> 94

Met	Lys	Ile	Gln	Met	Met	Ile	Leu	Lys	Lys	Asn	Ala	Ile	Lys	Leu	Lys
1				5					10					15	
Val	Glu	Leu	Glu	Asn	Ala	Gln	Lys	Asp	Ile	Asn	Gln	Ala	Lys	Lys	Asn
			20					25						30	
Leu	Glu	Asn	Ala	Glu	Ala	Lys	Asn	Glu	Ala	Leu	Gln	Arg	Gln	Ile	Ile
		35					40					45			
Leu	Asn	His	Asn	Gln	Asn	Glu	Val	Asn	Ser	His	Thr	Thr	Lys	Asn	Gln
	50					55					60				
Glu	Lys	Phe	Lys	Thr	Asp	Asn	Val	Thr	Glu	Glu	Tyr	Leu	Glu	Asp	Met
65					70					75					80
Ala	Leu	Met	Phe	Lys	Asn	Ser	Glu	Asp	Thr	Ala	Glu	Gln	Lys	Glu	Glu
				85					90					95	
Val	Asn	Cys	Gln	His	His	Glu	Glu	Gln	Asn	Arg	Gln	Lys	Gln	Glu	His
			100						105					110	
Ile	Asn	Thr	Glu	Glu	Glu	Ala	Val	His	Lys	Glu	Lys	Ile	Ile	His	Ile
			115					120					125		
Thr	Glu	Glu	Thr	Glu	Thr	Glu	Ala	Phe	Lys	Lys	Glu	Ile	Asp	Leu	
	130						135						140		

<210> 95  
 <211> 369  
 <212> PRT  
 <213> T. pallidum

<220>  
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 <223> conserved hypothetical protein

<220>  
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 <223> gi|3322751

<400> 95

Met	Cys	Gln	Lys	Ser	Ser	Pro	Cys	Thr	Tyr	Ala	Arg	Val	Arg	Ser	Leu	1	5	10	15
Pro	Ser	Val	Arg	Leu	Phe	Ser	Phe	Leu	Ala	Leu	Ala	Phe	Ala	Ser	Phe	20	25	30	
Leu	Arg	Ala	Glu	Asp	Ala	Phe	Asp	His	Phe	Arg	Glu	Gly	Glu	Arg	Leu	35	40	45	
Leu	Ser	Leu	Gln	Gln	Ala	Gln	Gln	Ala	Ile	Gly	Pro	Leu	His	Lys	Ala	50	55	60	
Ala	Gln	Gln	Lys	Pro	Ala	His	Pro	Lys	Ala	Ala	Leu	Tyr	Leu	Gly	Met	65	70	75	80
Ala	Tyr	Leu	Gln	Thr	Gly	Arg	Tyr	Thr	Gln	Ala	Ile	Gln	Trp	Leu	Gln	85	90	95	
Asn	Pro	Pro	Val	His	Ser	Gln	Glu	Tyr	Ala	His	Leu	Tyr	Ala	Tyr	Asn	100	105	110	
Leu	Gly	Asn	Val	Tyr	Phe	Val	Gln	His	Arg	Tyr	Glu	Glu	Ala	Gln	His	115	120	125	
Ala	Tyr	Glu	Gln	Ala	Leu	Ala	Leu	Lys	His	Asp	Tyr	Pro	Pro	Ala	Leu	130	135	140	
Leu	Asn	Arg	Ala	Asn	Thr	Ala	Met	Lys	Arg	Gln	Ala	Tyr	Ala	His	Ala	145	150	155	160
Leu	Ala	Asp	Tyr	Lys	Lys	Tyr	Val	Ser	Gln	Asn	Pro	Thr	Ala	Ser	Gln	165	170	175	
His	Tyr	Glu	Val	Gln	Arg	Met	Ile	Ala	Ala	Leu	Glu	Gln	Trp	Leu	Gln	180	185	190	
Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	195	200	205	
Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	210	215	220	
Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	225	230	235	240
Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	Arg	Lys	Glu	Ala	Glu	Glu	Ala	Arg	245	250	255	

Arg Lys Glu Ala Glu Glu Ala Arg Arg Lys Glu Ala Glu Glu Ala Arg  
 260 265 270  
 Arg Lys Glu Ala Glu Glu Ala Arg Arg Lys Glu Ala Glu Glu Ala Arg  
 275 280 285  
 Arg Lys Glu Ala Glu Glu Ala Arg Arg Lys Glu Ala Glu Glu Ala Arg  
 290 295 300  
 Arg Lys Glu Ala Glu Glu Ala Arg Arg Lys Glu Ala Glu Glu Ala Arg  
 305 310 315 320  
 Arg Lys Glu Ala Glu Glu Ala Arg Arg Lys Glu Ala Glu Phe Glu Ala  
 325 330 335  
 Leu Lys Arg Ala Leu Arg Leu Lys Gln Ala Glu Asp Ala Arg Thr Leu  
 340 345 350  
 Ser Thr Gly Ser Glu Asp Thr Val Pro Tyr Gln Glu Glu His Asn Leu  
 355 360 365

Glu

<210> 96  
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 <212> PRT  
 <213> T. pallidum  
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 <223> predicted coding region TP0266

<220>  
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 <223> gi|3322546

<400> 96

Met Val Arg Val Gln Arg Arg Val Leu Lys Asn Phe Met Arg Val Val  
 1 5 10 15  
 Gly Val Asp Lys Gly Tyr Arg Leu Trp Val Glu Trp Leu Ser Cys Val  
 20 25 30  
 Cys Cys Gly Tyr Val Val Arg Ala Glu  
 35 40

<210> 97  
 <211> 38  
 <212> PRT  
 <213> Vibrio cholerae

<220>  
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 <223> hypothetical protein

<220>  
 <221> misc\_feature  
 <223> gi|9654409

<400> 97

Met Ser Lys Gln Glu Met Lys Lys Pro Gln Leu Ser Leu Lys Glu Lys  
 1 5 10 15  
 Arg Lys Leu Lys Gln Glu Lys Ala Gln Glu Ser Ser Val Ile Lys Pro  
 20 25 30  
 Arg Lys Ser Lys Gly Arg  
 35

<210> 98  
 <211> 85  
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 <213> Vibrio cholerae

<220>  
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<220>  
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 <223> gi|9654544

<400> 98

Met Phe Leu Ser Phe Ile Cys Phe Tyr Ile Phe Lys Asn Gly Ser Tyr  
 1 5 10 15  
 Phe Ser Phe Ile Cys Leu Val Gly Cys Phe Gln Phe Phe Asp Phe Phe  
 20 25 30  
 Val Val Val Phe Ile Gly Phe Leu Phe Leu Phe Cys Ser Phe Gly Leu  
 35 40 45  
 Val Asp Phe Ser Phe Phe Tyr Phe Val Leu Ile Val Phe His Leu Phe  
 50 55 60  
 Gly Val Asp Leu Leu Ser Trp Phe Gly Trp Trp Gln Val Phe Leu Phe  
 65 70 75 80  
 Cys Asn Phe Ile Glu  
 85

<210> 99  
 <211> 43  
 <212> PRT  
 <213> Vibrio cholerae  
  
 <220>  
 <221> misc\_feature  
 <223> hypothetical protein

<220>  
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 <223> gi|9654912

<400> 99

Met	Leu	Asn	His	Leu	Leu	Val	Arg	Leu	Thr	Ile	Gly	Cys	Leu	Leu	Val
1				5					10					15	
Leu	Gly	Ile	Lys	Leu	Ser	Ala	Leu	Tyr	Phe	Leu	Pro	Met	Val	Leu	Leu
			20					25					30		
Leu	Asn	Thr	His	His	Lys	Glu	Phe	Phe	Gly	Trp					
			35				40								

<210> 100  
 <211> 31  
 <212> PRT  
 <213> Vibrio cholerae  
  
 <220>  
 <221> misc\_feature  
 <223> hypothetical protein

<220>  
 <221> misc\_feature  
 <223> gi|9656707

<400> 100

Met	Pro	Arg	His	Pro	Phe	Val	Phe	Val	Val	Ile	Pro	Lys	Pro	Pro	Phe
1				5					10					15	
Leu	Ala	Val	Val	Ile	Val	Leu	Arg	Phe	Val	Val	Thr	Arg	Tyr	Leu	
			20					25					30		

<210> 101  
 <211> 88  
 <212> PRT  
 <213> Vibrio cholerae



<220>  
 <221> misc\_feature  
 <223> hypothetical protein

<220>  
 <221> misc\_feature  
 <223> gi|9657609

<400> 101

Met Leu Ser Leu Ala Val Pro Leu Leu Phe Met Ser Leu Leu Gly Phe  
 1 5 10 15  
 Lys Leu Lys Leu Pro Tyr Gly Leu Leu Met Gly Leu Ile Ile Leu Thr  
 20 25 30  
 Leu Leu Leu Gly Trp Leu Gly Asn Val Ser Leu Leu Pro Val Leu Val  
 35 40 45  
 Val Leu Phe Phe Met Ser Pro Leu Leu Leu Ala Thr Lys Arg Ala Pro  
 50 55 60  
 Trp Gln Ser Ile Leu Phe Gly Val Gly Cys Leu Leu Pro Gln Leu Val  
 65 70 75 80  
 Gln Phe Val Met Leu Asn Gln Arg  
 85

<210> 102  
 <211> 33  
 <212> PRT  
 <213> Vibrio cholerae

<220>  
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 <223> hypothetical protein

<220>  
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 <223> gi|9657724

<400> 102

Met Arg Arg Leu Leu Cys Leu Ser Phe Asn Thr Leu His Leu Asn Gln  
 1 5 10 15  
 Ile Asn Asp Asn Gln Leu Lys Ser Leu Thr Lys Leu Arg Ile Ile Leu  
 20 25 30  
 Asn

<210> 103  
 <211> 34  
 <212> PRT  
 <213> Vibrio cholerae  
  
 <220>  
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 <223> hypothetical protein

<220>  
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 <223> gi|9657931

<400> 103

Met Gly Lys Ser Met Pro Ile Gln Leu Leu Leu Ser Ile Pro Phe  
 1 5 10 15

Leu Leu Asp Ala Ala Thr Pro Ser Arg Leu Gly Ile Lys Ile Leu Ile  
 20 25 30

Leu Lys

<210> 104  
 <211> 36  
 <212> PRT  
 <213> Vibrio cholerae  
  
 <220>  
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 <223> hypothetical protein

<220>  
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 <223> gi|9658035

<400> 104

Met Gly Tyr Pro Ser Met Ala Ala Ala Leu His Ala Ala Ala Leu Asn  
 1 5 10 15

Ile Ala Leu Asn Ile Gln Leu Asn Ile Ser Met Arg Ala Met Leu Leu  
 20 25 30

Ala Phe Leu Glu  
 35

<210> 105  
 <211> 38

9654360

<212> PRT  
<213> Vibrio cholerae  
  
<220>  
<221> misc\_feature  
<223> hypothetical protein

<220>  
<221> misc\_feature  
<223> gi|9658254

<400> 105

Met Leu Ile Arg Glu Leu Ala Leu Ala Ala Tyr Gln Phe His Arg Tyr  
1 5 10 15  
Phe Lys Ile His Phe Met Phe Gln Phe Lys Val Phe Leu Phe Leu Ala  
20 25 30  
Lys Gly Phe Phe Ser Phe  
35

<210> 106  
<211> 35  
<212> PRT  
<213> Vibrio cholerae  
  
<220>  
<221> misc\_feature  
<223> hypothetical protein

<220>  
<221> misc\_feature  
<223> gi|9656580

<400> 106

Met Lys Leu Asn Asp Leu Asn Lys Lys Pro Leu Val Ile Lys Lys Thr  
1 5 10 15  
Ala Leu Ser Phe Gln Lys Leu Lys Lys Leu Gln Gln Pro Val Lys Lys  
20 25 30  
Phe His Phe  
35

<210> 107  
<211> 665  
<212> PRT  
<213> Plasmodium falciparum

<220>  
 <221> misc\_feature  
 <223> hypothetical protein

<220>  
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 <223> gi|3845248

<400> 107

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Met Gln Tyr Phe Phe Leu Val Phe Leu Ala Val Leu Ala Lys Gly Phe
1          5          10          15

Leu Arg Asn Lys Glu His Ala Asn Leu Ile Asn Ser Tyr Asn Asp Ile
          20          25          30

Val Glu Asp Ile Asn Ile Lys Lys Glu Glu Lys Ser Ser Ser Glu Pro
          35          40          45

Pro Phe Ile Pro Ile Lys Asn Lys Ile Asp Asn Val His Thr Lys Asn
          50          55          60

Asn Asn Gln Tyr Asn Leu His Asn Asn Lys Ser Asn Lys Thr His Leu
65          70          75          80

Thr Tyr Gly Thr His Thr Ser Phe Leu Gln Asn Cys Thr Ile Asn Asp
          85          90          95

Cys Val Asp Val Asp Asn Lys Asp Ser Glu Ile Asn Asn Ile Thr Lys
          100          105          110

Glu Lys Asp Asp Asn Asn Asn Asn Asn Gly Thr Lys Gln Ile Glu Glu
          115          120          125

Lys Asn Lys Ile Asn Lys Ser Asp Leu His Arg Gln Asn Glu Leu Asn
          130          135          140

Leu Gln Ser Gly Lys Asn Glu Gln Asp Ile Asn Lys Asn Glu Lys Gly
145          150          155          160

Lys Gln Asp Ile Ser Asn Ser Asn Ala Glu Asn Lys Lys Asp Val Lys
          165          170          175

Glu Gly Val Lys Glu Leu Glu Glu Lys Lys Lys Glu Glu Lys Ile Ser
          180          185          190

Asp Asp His Lys Val Glu Glu Asn Lys Lys Ser Asp Asp His Lys Val
          195          200          205

Glu Glu Asn Lys Lys Ser Asp Asp His Lys Val Glu Glu Asn Lys Lys
          210          215          220

Ser Asp Asp His Lys Ile Glu Glu Val Lys Lys Val Glu Glu His Glu

```

225				230				235				240				
Glu	Asp	Glu	Glu	Glu	Asp	Lys	Lys	Glu	Lys	Lys	Ser	Glu	Asn	Lys	Asn	
				245					250					255		
Lys	Asp	Glu	Asn	Lys	Asp	Glu	Asn	Asp	Glu	Asp	Asn	Asp	Glu	Ile	Ser	
				260					265					270		
Asp	Glu	Asp	Glu	Val	Asp	Asp	Asp	Val	Glu	Glu	Asp	Lys	Asn	Glu	Asn	
				275					280					285		
Asp	Asp	Ile	Asp	Asp	Asp	Lys	Lys	Glu	Thr	Asp	Lys	Thr	His	Leu	Glu	
				290					295					300		
Glu	Glu	Glu	Asn	Glu	Ile	Ile	Glu	Lys	Glu	Phe	Ser	Asp	Lys	Lys	Lys	
305					310					315					320	
Asn	Gly	Lys	Asn	Lys	Asp	Thr	Lys	Lys	Glu	Lys	Ser	Lys	Asp	Thr	Glu	
				325					330					335		
Lys	Glu	Lys	Ser	Lys	Asp	Ile	Glu	Lys	Glu	Lys	Ser	Lys	Asp	Lys	Glu	
				340					345					350		
Lys	Glu	Lys	Ser	Lys	Asp	Lys	Glu	Lys	Glu	Lys	Gly	Lys	Asp	Lys	Glu	
				355					360					365		
Lys	Glu	Lys	Ser	Lys	Asp	Ile	Glu	Lys	Glu	Lys	Glu	Lys	Asp	Lys	Asp	
				370					375					380		
Ile	Glu	Lys	Glu	Lys	Ser	Lys	Asp	Thr	Ala	Lys	Glu	Lys	Glu	Lys	Asp	
385					390					395					400	
Lys	Asp	Ile	Glu	Lys	Glu	Lys	Ser	Lys	Asp	Met	Glu	Lys	Leu	Lys	Asn	
				405					410					415		
Lys	Gln	Asn	Asp	Glu	Lys	Lys	Lys	Asp	Asp	Asn	Glu	Lys	Lys	Lys	Asn	
				420					425					430		
Asp	Lys	Gln	Asp	Ile	His	Asp	Asp	Asn	Asp	Asp	Glu	Asn	Asp	Met	Glu	
				435					440					445		
Glu	Ile	Glu	Glu	Asn	Asp	Asp	Glu	Glu	Asp	Glu	Asp	Glu	Asp	Met	Glu	
				450					455					460		
Asn	Lys	Lys	Lys	Lys	Lys	Lys	Gly	Lys	Asn	Gly	Asn	Glu	Asn	Gly	Asn	
465					470					475					480	
Glu	Asn	Gly	Ser	Glu	Asn	Gly	Asn	Glu	Asn	Gly	Asn	Glu	Asn	Gly	Asn	
				485					490					495		
Glu	Asn	Glu	Asn	Lys	Asn	Glu	Ser	Glu	Asn	Glu	Asn	Glu	Asn	Glu	Asn	
				500					505					510		
Glu	Asn	Glu	Asn	Gly	Asn	Glu	Asn	Glu	Asn	Glu	Lys	Glu	Asn	Glu	Lys	
				515					520					525		

Asp Lys Asn Ile Lys Glu Ile Glu Asn Val Thr Asn Ala Asn Lys Glu  
530 535 540

Asn Tyr Glu Lys Ile Asn Lys Asn Ser Glu Ile Thr Ile Thr Lys Ser  
545 550 555 560

Asn Ile Asp Ile Tyr Asn Asn Asn Arg Asn Asn Asp Ile Asp Lys Val  
565 570 575

Asn Asn His Ile Phe Thr Asn Gln Gln Lys Lys His Asn Leu His Asn  
580 585 590

Glu Gln Asn Lys Phe Asn Glu Thr Leu Asn Val Ser Thr Asn His Lys  
595 600 605

Asn His Tyr Glu Glu Lys Lys Lys Tyr Glu Ser Asn Met Phe Asn Val  
610 615 620

Asp Lys Arg Met His Lys Asn Leu Thr Ser Met Asp Thr Ile Leu His  
625 630 635 640

Asn Leu Asn Asp Lys Leu Ser His His Lys Asp Leu Lys Asn Val Leu  
645 650 655

Asn Asp Lys Lys Lys Lys Lys Asn Lys  
660 665

<210> 108  
<211> 807  
<212> PRT  
<213> Plasmodium falciparum

<220>  
<221> misc\_feature  
<223> hypothetical protein

<220>  
<221> misc\_feature  
<223> gi|3845292

<400> 108

Met Ala Val Glu Ser Lys Pro Asn Asn Ser Ser Lys Glu Lys Asn Glu  
1 5 10 15

Glu Asn Asp Ile Ile Asn Lys Cys Asp Asp Ser Asn Lys Ile Asn Gly  
20 25 30

Lys Glu Asn Ile Phe Ala Val Glu Lys Val Gly Ile Asn Glu Ser Gly  
35 40 45

His Met Ser Asn Asp Asn Ile Asn Lys Asn Gln Glu Lys Asn Lys Lys

60

Thr Gln Asn Lys Met Asn Asn Met Lys Thr Lys Gln Ile Gly His Tyr  
340 345 350





Ile Val Thr Lys Gly Lys Lys Lys Lys Asn Thr Asn Lys Lys Lys Lys  
 645 650 655  
 Ile Asn Asn Ile Asn Ser Val Asn Asn Val Asn Asn Ile Asn Ser Met  
 660 665 670  
 Asn Asn Ile Asn Ser Met Asn Asn Ile Ile Ser Met Asn Asn Val Asn  
 675 680 685  
 Asn Met Asn Asn Pro Met Tyr Phe Pro Asn Val Asn Ile Gln Lys Asp  
 690 695 700  
 Asp Ser Asn Ile Ala Leu Leu Tyr Asn Asn Lys Pro Asn Ile Asp Phe  
 705 710 715 720  
 Asn Asn Phe Gln Leu Asn His Ile Asn Asn His Met Ile Gln Asn Asn  
 725 730 735  
 Ile Met Thr Asn Asn Val Met Leu Asn Asn Asn Leu Thr Thr Ser Asn  
 740 745 750  
 Phe Asn Tyr Asn Leu Ile Asn Tyr Ser Tyr Glu Pro Phe Tyr Glu Glu  
 755 760 765  
 Asn Leu Met Asn Asp Leu Asp Tyr Cys Arg Asp Ile Ser Leu Tyr Glu  
 770 775 780  
 Lys Arg Tyr Asp Arg Gly Asp Asn Leu Gln Gln Asn His Lys Arg Tyr  
 785 790 795 800  
 Asp Ile Asp Phe Pro Ser Leu  
 805

<210> 109  
 <211> 861  
 <212> PRT  
 <213> Plasmodium falciparum

<220>  
 <221> misc\_feature  
 <223> hypothetical protein

<220>  
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 <223> gi|4493994

<400> 109

Met Tyr Glu Leu Leu Leu Leu Arg Phe Leu Lys Tyr Glu Cys Asp Tyr  
 1 5 10 15  
 Asp Asp Ser Glu Asp Ile Leu Asn Lys Tyr Cys Phe Ile Arg Glu Arg  
 20 25 30

Lys	Tyr	Asn	Lys	Pro	Gly	Gly	Asn	Lys	Tyr	Ile	Pro	Arg	Asp	Arg	Ser
35						40				45					
Asn	Asn	Asn	Asn	Asn	Ile	Gly	Asn	Asn	Val	Asn	Gly	Met	Asn	Asn	Phe
50						55				60					
Val	Leu	Leu	Asn	Asn	Asn	Asn	Asn	Asn	Met	Arg	Ile	Arg	Asn	Thr	Tyr
65					70				75						80
Asn	Asn	Asn	Asn	Asn	Asn	Ile	Asn	Asn	Asn	Asn	Asn	Asn	Asn	Asn	Asn
				85				90						95	
Asn	Phe	Asn	Asn	Phe	Asn	Asn	Asn	Asn	Asn	Asn	Asn	Asn	Phe	Asn	Asn
		100						105				110			
Phe	Asn	Asn	Phe	Asn	Asn	Asn	Asn	Asn	Phe	Asn	Asn	Asn	Asn	His	Phe
115						120				125					
Asn	Ile	His	Asn	Ile	Asp	Asn	Tyr	Asp	Asp	Ser	Tyr	Val	Lys	Gly	Arg
130						135				140					
His	Arg	Gly	Asn	Tyr	Leu	Ser	Ser	Ser	Leu	Asn	Asn	Ile	Asn	Gly	Lys
145					150				155						160
Val	Phe	Lys	Asn	Leu	Asp	Asp	Asn	Cys	Tyr	Asn	Leu	Pro	Thr	Asn	Asn
				165				170						175	
Leu	Tyr	Ile	Asp	Lys	Glu	Gly	Lys	Met	His	Leu	Thr	Gly	Lys	Glu	His
		180						185				190			
Tyr	Asn	Ala	Ala	Ser	Ser	Asn	Glu	Tyr	Asn	His	Asn	Asn	Lys	Asn	Thr
195						200				205					
Asn	Asn	Tyr	Asn	Asn	Asn	Ser	Tyr	Asn	Asn	Asn	Asn	Phe	Cys	Asn	Asn
210						215				220					
Asn	Tyr	Asn	Asp	Asn	Asn	Tyr	Asn	Asn	Ser	Asn	Asn	Lys	Gly	Met	Gly
225					230				235						240
Asn	Lys	Tyr	Glu	Arg	Ser	Leu	Asn	Tyr	Leu	Lys	Lys	Glu	His	Asp	Met
				245				250						255	
Val	Asp	Tyr	Glu	Tyr	Asn	Asn	Lys	Gly	Asn	Ile	Arg	Lys	Asn	Asp	Ser
		260						265				270			
Glu	Lys	Tyr	Trp	Asp	Asn	Pro	Pro	Leu	His	Tyr	Ser	Lys	Lys	Asn	Asn
275						280				285					
Tyr	Asp	Ile	Phe	Thr	Leu	Gly	Asp	Ile	Lys	Lys	Tyr	Ala	Lys	Asn	Asn
290						295				300					
Glu	Lys	Lys	Gly	Asn	Asn	Lys	Tyr	Met	Asn	Met	His	Asp	Asn	Asn	Ser
305					310				315						320

Asn Asn Ser Asn Asn Val Leu Asn Asn Asn Asn Met Asn Ser Asn Ser  
325 330 335

Asn Asn Tyr Asn Asn Ile Phe Lys Asp Asn Asp Glu Glu Asn Leu Thr  
340 345 350

Lys Ser Asn Phe Ala Lys Trp Phe Lys Asn Asn Asn Asn Met Asn Val  
355 360 365

Asn Glu Asn Thr Asp Ile Ile Lys Tyr Leu Asn Asn Lys Asn Ser Gln  
370 375 380

Gly His Ser Asp Gly Lys Asn Asn Asn Asn Asn Asn Gly Asn Asn Ile  
385 390 395 400

Ile Asn Asn Asn Ser Asn Asn Lys Asn Asn Ile Phe Gln Gly Asn Ser  
405 410 415

Arg Asn Tyr Glu Asn Val Met Tyr Asn Ile Asn Asn Asn Asn Asn Asn  
420 425 430

Asn Ile Ile Ser Asn Asn Lys Asn Glu Ala Ser Phe Asn Thr Asp Asn  
435 440 445

Ile Asn Thr Asn Ser Gly Arg Glu Glu Glu Lys Ile Ser Asn Thr Val  
450 455 460

Ala Glu Leu Leu Met Lys Gln Ile Ser Met Ile Lys Glu Arg Asn Lys  
465 470 475 480

Gly Leu Asp Val Leu Glu Lys Lys Asn Thr Phe Gly Phe Leu Asp Asn  
485 490 495

Asn Tyr Gln Asn Tyr Gly Ser Asn Asn Asn Ser Ser Leu Glu Lys Asn  
500 505 510

Asn Met Lys Glu Asn Asp Ile Tyr Ser Lys Glu Ala Ser Lys Arg Ile  
515 520 525

Met Asp Ile Phe Arg Thr Leu Asn Ser Asn Gly Leu Val Ser Gln Glu  
530 535 540

Ser Leu Leu Val Asn Gln Ser Val Leu Asn Asn Asn Asn Asn Tyr Asn  
545 550 555 560

Asn Tyr Asn Ser Asn Asn Asn Arg Asn Lys Asn Gln Asn Asn Asn Asn  
565 570 575

Asn Asn Asn Asn Asn Met Asn Asn Met Asn Asn Ser Asn Asn Asn Ile  
580 585 590

Asn Asn Asn Asn Asn Tyr Tyr Lys Asn Asn His Lys Tyr His Ser Met  
595 600 605

Asp Asn Val Thr Tyr Lys Lys Ile Phe Ile Asn Asn Tyr Ser Asn Asn

610	615	620
Asp Gly Asn Asn Asn Ser Asn Asn Ser Asn Ser Asn Asn Asn Val Glu		
625	630	635 640
His Tyr Tyr Met Asn Asn Lys Lys Asn Phe Lys Asn Lys Ile Asn Asn		
	645	650 655
Tyr His Asn Leu Pro Asp Asn Lys Asn Asn Met Met Asn Asn Asn Thr		
	660	665 670
Tyr Asn Asn Ile Asn Lys Asn Asn Leu Ser Asn Met Glu Asn Phe Pro		
	675	680 685
Pro Ser Leu Ser Phe Asn Asn Ser Asp Ile Asn Lys Asn Asn Ala Gln		
	690	695 700
Gly Asn Ile Asn Ile Thr Pro Ile Ile Asn Ser Ile Leu Arg Leu Asp		
705	710	715 720
Asn Glu Val Asp Asn Val His Asn Asn Ser Ile Ser Glu Asn Ile Gln		
	725	730 735
Asn Ala Lys Val Ser Asn Val Leu Asp Ser Leu Lys Ser Leu Leu Lys		
	740	745 750
Ala Ser Lys Ser Gln Gly Asn Asn Asn Tyr Asn Ile Pro Lys Asn Phe		
	755	760 765
Asn Asn Asn Asn Asn Asn Asn Asn Asn Ser Lys Phe Ile Asn Tyr Asn		
	770	775 780
Ser Gln Gln Tyr Tyr Pro Ser His Gln Gln Gln Gln Gln Gln His Gln		
785	790	795 800
Gln Gln Gln Gln Gln Gln Gln Gln Gln Thr Leu Ile Gln Thr Gln Ile		
	805	810 815
Asn Ser Thr His Leu Asn Asp Phe Asn Lys Lys Lys Phe Asn Lys Lys		
	820	825 830
Glu Arg Tyr Pro Met Lys Tyr Pro Glu Phe Asp Gly Thr Thr Asn Glu		
	835	840 845
Thr Met Met Val Arg Glu Lys Ala Glu Arg Gln Leu Val		
	850	855 860

- <210> 110
- <211> 54
- <212> PRT
- <213> Plasmodium falciparum
- <220>
- <221> misc\_feature
- <223> Homologue of C.elegans F49C12.11 protein

<220>  
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 <223> gi|4494004

<400> 110

Met Pro Leu Asn Thr Gln Gly Gly Lys Lys Lys Pro Leu Lys Ala Ala  
 1 5 10 15  
 Lys Lys Gly Pro Val Glu Leu Thr Glu Glu Asp Ile Ala Phe Lys Lys  
 20 25 30  
 Glu Met Ala Glu Lys Lys Lys Ala Glu Glu Glu Ala Lys Gln Lys Leu  
 35 40 45  
 Leu Lys Ala Lys Lys Lys  
 50

<210> 111  
 <211> 71  
 <212> PRT  
 <213> L. major  
 <220>  
 <221> misc\_feature  
 <223> hypothetical protein P1105.01

<220>  
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 <223> gi|6996498

<400> 111

Met Arg Glu Arg Leu Ser Thr Asp Glu Tyr Val Tyr Trp Ser Gly Ile  
 1 5 10 15  
 Leu Leu Pro Leu Ile Arg Val Ile Asp Leu Ala Ser Val Asp Ser Pro  
 20 25 30  
 Leu Ala Leu Ala Leu Arg Ala Cys Val Cys Val Cys Val Cys Val Cys  
 35 40 45  
 Val Cys Val Cys Val Cys Val Cys Val Val Val Phe Leu Pro Leu Pro  
 50 55 60  
 Ser Leu Arg Ala Gln Ser Pro  
 65 70

<210> 112  
 <211> 923

<212> PRT  
 <213> L. major  
  
 <220>  
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 <223> AC005941\_2 L5204.2

<220>  
 <221> misc\_feature  
 <223> gi|6978417

<400> 112

Met	Gln	Leu	Ser	Gln	Glu	Asp	Glu	Glu	Ala	Ile	Arg	Thr	Leu	Arg	Gly
1				5					10					15	
Glu	Ile	Glu	Ala	Ala	Trp	Ala	Lys	Ala	Asp	Thr	Ala	His	Glu	Gln	Glu
			20					25					30		
Gln	Arg	Ser	Arg	Glu	Leu	Leu	His	Thr	Leu	Arg	Gln	Gln	Val	Thr	Glu
		35					40					45			
Leu	Asp	Ala	Met	Val	Glu	Lys	Thr	Ala	Gly	Leu	Ser	Met	Gly	Gln	Glu
	50					55					60				
Ala	Tyr	Leu	Arg	Asp	Leu	Leu	Thr	Val	Lys	Lys	Asp	Arg	Glu	Glu	Glu
65					70					75					80
Ala	Met	Leu	Leu	His	Ala	Ala	Leu	Asn	Arg	Thr	Glu	Ala	Asp	His	Arg
				85					90					95	
Gln	Val	Cys	Val	Gln	Leu	Ala	Ala	Ala	Lys	Gln	Ala	His	Glu	Ala	Ala
			100					105					110		
Gln	Arg	Glu	Arg	Asp	Glu	Gln	Arg	Gln	Val	Tyr	Gln	His	Leu	Leu	Thr
		115					120					125			
Ser	Leu	Glu	Ala	Glu	Gln	Arg	Glu	Arg	Ala	Ala	Lys	Glu	Ala	Ser	Val
		130				135					140				
Arg	Gln	Tyr	Arg	Asp	Thr	Thr	Glu	Leu	Cys	Met	Arg	Arg	Leu	Asp	Glu
145					150					155					160
Arg	Gly	Val	Glu	Val	Glu	Arg	Ala	Ile	Arg	Glu	Glu	Lys	Lys	Ala	Ala
			165					170						175	
Lys	Glu	Ala	Glu	Gly	Thr	Ala	Gln	Glu	Ile	Gln	Ala	Ile	Ala	Arg	Gln
			180					185					190		
Leu	Gln	Glu	Arg	Gln	Glu	Arg	Phe	Gly	Val	Glu	Ala	Ala	Arg	Leu	Ala
		195					200					205			
Ala	Ala	Glu	Arg	Glu	Asn	Thr	Ile	Leu	Thr	Arg	Glu	Leu	Pro	Gln	Arg

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Gln Ala Ala Leu His Glu Gln Gln Asp Glu Leu Lys Arg Glu Glu Lys		
225	230	235 240
Gln Leu His Leu Leu Glu Lys Ser Ala Arg Ala Gln Gln Ala Glu Leu		
	245	250 255
Ala Ala Leu Val Glu Lys Arg Ala Thr Ala Ala Ala Val Gln Thr		
	260	265 270
Arg Ala Asn Ser Val Asp Ala Ala Leu Thr Glu Leu Ala Thr Glu Glu		
	275	280 285
Lys Ala Arg Ala Ala Leu Glu Glu Ala Val Ala Lys Glu Met Gln Arg		
	290	295 300
Lys Thr Asn Thr Met His Thr Asn Thr Phe Lys Ala Thr Ala Ser Ser		
305	310	315 320
Lys Val Glu Gly Gln Arg Val Met Glu Ala Gly Lys Ser Arg Arg Leu		
	325	330 335
His Gln Gln Leu Glu Leu Leu Arg Thr Glu Asn Glu Lys Met Arg Lys		
	340	345 350
Glu Ile Tyr Tyr Ala Glu Gln Asn His Glu Lys Asn Thr Lys Glu Ala		
	355	360 365
Gln Gln Ala Leu Leu Asn Tyr His Arg Thr Leu Asp Ala Ile Arg Thr		
	370	375 380
Arg Arg Ser Glu Ala Lys Ala Val Glu Glu Asp Ile Ala Leu His Gln		
385	390	395 400
Lys Lys Leu Lys Ala Gln Gln Ala Leu Leu Ser Thr Val Thr Ala Asp		
	405	410 415
Arg Gln Lys Thr Glu Lys Ala Leu Arg Glu Thr Glu Ala Glu Leu Leu		
	420	425 430
Leu Leu Arg Asn Arg His Ala Ser Lys Gln Glu Glu Leu Glu Ser Val		
	435	440 445
Lys Thr Glu Leu Ile Gln Gln Glu Ala Asp Met Cys Gln Leu His Gly		
	450	455 460
Leu Ser Arg Gln Leu Asn Lys Asp Val Ala Asn Thr Glu Gln Arg Leu		
465	470	475 480
Arg Phe Leu Arg Glu Asp Gln Gln His Ala Glu Ser Arg Val Glu Ala		
	485	490 495
Leu Arg Ser Glu Ala Gln Glu Leu Arg Gln Val Ile Ala Gln Tyr Asp		
	500	505 510





Ser Ala Glu Gln Arg Arg Thr Asn Thr Asp Asp Arg Ser Pro Ser Ala  
805 810 815

Gly Gly Pro Ala Ser Ala Asp Val Glu His Arg Ser Ala Ser Gln Pro  
820 825 830

Gln Gln Pro His Ser His Ala Gly Gly Ser Ala Ile Val Ser Asn Ser  
835 840 845

His Asn Gly Val Gln Ala Ala Ala Ser Gly Thr Gly Arg Met Ser Ala  
850 855 860

Ala Asn Ser Gly Arg Val Gly Asn Gly Ser Val Pro Pro Arg Asn Gly  
865 870 875 880

Arg Arg Arg Ala Pro Leu Ala Glu Ala Ile Leu Asp Thr Leu Thr Ala  
885 890 895

Gly Pro Pro Gln Pro Asn Phe Pro Leu Gln Arg Pro Pro His Gln Arg  
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Gln Phe Val Gly Gly Gly Phe Ser Leu Thr Arg  
915 920

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Gln Gln Arg Val Lys Val Cys Gln Tyr Gln Asp Cys Gly Ala Pro Phe  
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Gly Phe Phe Ser Thr Lys Val Asn Cys His Arg Cys Gly Ile Val Leu  
35 40 45

Cys Ser Lys Cys Ala Ala Thr Lys Thr Val Ile Pro Arg Tyr Tyr Ser  
50 55 60

Asn Glu Thr Val Pro Val Cys Gln Arg Cys Tyr Gln Val Val Glu Arg  
65 70 75 80

Tyr	Lys	Glu	Arg	Gly	Ser	Val	Thr	Pro	Gly	Tyr	Val	Val	His	Ser	Thr	85	90	95
Thr	Ile	Ser	Ala	Thr	Pro	Ala	Arg	Ser	Ser	Pro	Val	Pro	Pro	Leu	His	100	105	110
Thr	Thr	Pro	Ala	Leu	Arg	Pro	His	Ala	Pro	Ser	Pro	Gln	Pro	Ala	Ser	115	120	125
Val	Val	Ser	Thr	Ala	Thr	Leu	Val	His	Pro	Val	Glu	Glu	Asp	Ala	Val	130	135	140
Ser	Thr	Lys	Pro	Ser	Val	Ser	Glu	Ala	Asp	Leu	His	Ala	Leu	Arg	Ser	145	150	155
Ile	Ile	Glu	Thr	Leu	Gln	Gln	Ala	Leu	Asn	Asp	Glu	Gln	His	Asn	Ala	165	170	175
Ala	Leu	Ala	Ala	Thr	Ser	Ala	Ala	Glu	Gln	Leu	Arg	Thr	Ala	Lys	Glu	180	185	190
Glu	Asn	Thr	Ala	Leu	Lys	Ser	Thr	Ala	His	Leu	Leu	Gln	Gln	Arg	Leu	195	200	205
Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Arg	Val	Ala	Arg	210	215	220
Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	225	230	235
Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	245	250	255
Leu	Glu	Ala	Arg	Val	Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	260	265	270
Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	275	280	285
Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Val	Ala	Arg	Leu	Ala	290	295	300
Ala	Asp	Gly	Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	305	310	315
Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	325	330	335
Ala	Arg	Val	Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	340	345	350
Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	355	360	365



660					665					670					
Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln
675					680					685					
Arg	Ala	Glu	Leu	Glu	Ala	Gln	Leu	Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp
690					695					700					
Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg
705					710					715					
Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Val	Ala
720					725					730					
Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn
735					740					745					
Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala
745					750					755					
Glu	Leu	Glu	Ala	Gln	Leu	Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala
760					765					770					
Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp
775					780					785					
Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Val	Ala	Arg	Leu
790					795					800					
Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu
805					810					815					
Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu
820					825					830					
Glu	Ala	Gln	Val	Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln
835					840					845					
Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala
850					855					860					
Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Val	Ala	Arg	Leu	Ala	Ala
865					870					875					
Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg
885					890					895					
Ala	Glu	Leu	Glu	Ala	Arg	Val	Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu
900					905					910					
Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu
915					920					925					
Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Leu	Ala	Arg
930					935					940					
Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Leu	Ala	Arg
945					950					955					



Leu Ala	Ala Asp Gly Asp Glu	Ala' Arg Gln Gln Leu	Ala Ala Asn
1235	1240	1245	
Ala Glu	Glu Leu Gln Gln Arg	Leu Asp Thr Ala Thr	Gln Gln Arg
1250	1255	1260	
Ala Glu	Leu Glu Ala Gln Leu	Ala Arg Leu Ala Ala	Asp Arg Asp
1265	1270	1275	
Glu Ala	Arg Gln Gln Leu Ala	Ala Asn Ala Glu Glu	Leu Gln Gln
1280	1285	1290	
Arg Leu	Asp Thr Ala Thr Gln	Gln Arg Ala Glu Leu	Glu Ala Gln
1295	1300	1305	
Val Ala	Arg Leu Ala Ala Asn	Ala Glu Glu Leu Gln	Gln Arg Leu
1310	1315	1320	
Asp Thr	Ala Thr Gln Gln Arg	Ala Glu Leu Glu Ala	Arg Val Ala
1325	1330	1335	
Arg Leu	Ala Ala Asp Arg Asp	Glu Ala Arg Gln Gln	Leu Ala Ala
1340	1345	1350	
Asn Ala	Glu Glu Leu Gln Gln	Arg Leu Asp Thr Ala	Thr Gln Gln
1355	1360	1365	
Arg Ala	Glu Leu Glu Ala Arg	Val Ala Arg Leu Ala	Ala Asp Arg
1370	1375	1380	
Asp Glu	Ala Arg Gln Gln Leu	Ala Ala Asn Ala Glu	Glu Leu Gln
1385	1390	1395	
Gln Arg	Leu Asp Thr Ala Thr	Gln Gln Arg Ala Glu	Leu Glu Ala
1400	1405	1410	
Gln Val	Ala Arg Leu Ala Ala	Asn Ala Glu Glu Leu	Gln Gln Arg
1415	1420	1425	
Leu Asp	Thr Ala Thr Gln Gln	Arg Ala Glu Leu Glu	Ala Arg Val
1430	1435	1440	
Ala Arg	Leu Ala Ala Asp Arg	Asp Glu Ala Arg Gln	Gln Leu Ala
1445	1450	1455	
Ala Asn	Ala Glu Glu Leu Gln	Gln Arg Leu Asp Thr	Ala Thr Gln
1460	1465	1470	
Gln Arg	Ala Glu Leu Glu Ala	Gln Val Ala Arg Leu	Ala Ala Asp
1475	1480	1485	
Arg Asp	Glu Ala Arg Gln Gln	Leu Ala Ala Asn Ala	Glu Glu Leu
1490	1495	1500	
Gln Gln	Arg Leu Asp Thr Ala	Thr Gln Gln Arg Ala	Glu Leu Glu

1505	1510	1515
Ala Arg Val Ala Arg Leu	Ala Ala Asp Gly Asp	Glu Ala Arg Gln
1520	1525	1530
Gln Leu Ala Ala Asn Ala	Glu Glu Leu Gln Gln	Arg Leu Asp Thr
1535	1540	1545
Ala Thr Gln Gln Arg Ala	Glu Leu Glu Ala Gln	Leu Ala Arg Leu
1550	1555	1560
Ala Ala Asp Arg Asp Glu	Ala Arg Gln Gln Leu	Ala Ala Asn Ala
1565	1570	1575
Glu Glu Leu Gln Gln Arg	Leu Asp Thr Ala Thr	Gln Gln Arg Ala
1580	1585	1590
Glu Leu Glu Ala Arg Val	Ala Arg Leu Ala Ala	Asp Gly Asp Glu
1595	1600	1605
Ala Arg Gln Gln Leu Ala	Ala Asn Ala Glu Glu	Leu Gln Gln Arg
1610	1615	1620
Leu Asp Thr Ala Thr Gln	Gln Arg Ala Glu Leu	Glu Ala Arg Val
1625	1630	1635
Ala Arg Leu Ala Ala Asp	Arg Asp Glu Ala Arg	Gln Gln Leu Ala
1640	1645	1650
Ala Asn Ala Glu Glu Leu	Gln Gln Arg Leu Asp	Thr Ala Thr Gln
1655	1660	1665
Gln Arg Ala Glu Leu Glu	Ala Gln Leu Ala Arg	Leu Ala Ala Asp
1670	1675	1680
Arg Asp Glu Ala Arg Gln	Gln Leu Ala Ala Asn	Ala Glu Glu Leu
1685	1690	1695
Gln Gln Arg Leu Asp Thr	Ala Thr Gln Gln Arg	Ala Glu Leu Glu
1700	1705	1710
Ala Gln Leu Ala Arg Leu	Ala Ala Asp Gly Asp	Glu Ala Arg Gln
1715	1720	1725
Gln Leu Ala Ala Asn Ala	Glu Glu Leu Gln Gln	Arg Leu Asp Thr
1730	1735	1740
Ala Thr Gln Gln Arg Ala	Glu Leu Glu Val Glu	Met Ala Val Leu
1745	1750	1755
Leu Arg Glu Arg Glu Glu	Ala Arg Gly Glu Thr	Ala Val Ala Gly
1760	1765	1770
Glu Gln Val Gln Leu Tyr	Arg Glu Thr Val Glu	Glu Glu Glu Cys
1775	1780	1785

Leu	Lys	Glu	Glu	Arg	Trp	Cys	Leu	Glu	Ser	Arg	Val	Ala	Gln	Leu
	1790					1795					1800			
Arg	Glu	Ala	Ser	Ala	Ala	Ala	Lys	Gln	Gln	Arg	Gln	Glu	Val	Ala
	1805					1810					1815			
Ala	Lys	Ala	Asn	Glu	Val	Gln	Glu	Arg	Leu	Asp	Ser	Met	Ala	Arg
	1820					1825					1830			
Arg	Cys	Ile	Ala	His	Glu	Gly	Asp	Ala	Pro	Gln	Arg	Ala	Asp	Gly
	1835					1840					1845			
Arg	Asp	Asp	Ala	Leu	Arg	Gln	Leu	Ala	Asn	Leu	Arg	Glu	Glu	Val
	1850					1855					1860			
Lys	Leu	Ser	Glu	Lys	Gln	Lys	Ala	Met	Glu	Arg	Val	Ile	Pro	Gly
	1865					1870					1875			
Val	Arg	Glu	Arg	Gln	Met	Arg	Leu	Glu	Ala	Ala	Glu	Glu	Gln	Arg
	1880					1885					1890			
Ala	Asp	Leu	Glu	Ala	Arg	Leu	Val	Asp	Glu	Ala	Gly	Asp	Leu	Arg
	1895					1900					1905			
Ser	Arg	Pro	Ala	Ala	Ser	Thr	Asn	Glu	Val	Asn	Leu	Tyr	Arg	Asp
	1910					1915					1920			
Leu	Ala	Leu	Gln	Glu	His	Glu	Ala	Ala	Gln	Asn	Arg	Cys	Thr	Thr
	1925					1930					1935			
Leu	Glu	Ala	Gln	Val	Ala	Ser	Leu	Thr	Ser	Asp	Arg	Asp	Asn	Gly
	1940					1945					1950			
Arg	Gln	Gln	Glu	Ser	Ala	Asp	Leu	Ser	Glu	Ala	Gln	Arg	His	Leu
	1955					1960					1965			
Asp	Asn	Val	Gln	Glu	Arg	Asp	Met	Ala	His	His	Arg	Cys	Ala	Ala
	1970					1975					1980			
Leu	Glu	Glu	Gln	Asn	Ala	Ala	Met	Ala	Ser	Glu	Leu	Gln	Ala	Val
	1985					1990					1995			
Lys	Ala	Lys	Leu	Arg	Gln	Ala	Ser	Val	Lys	Ala	Ser	Ser	Leu	Met
	2000					2005					2010			
Thr	Arg	Leu	Ser	Ala	Ser	Ser	Ser	Gly	Ala	Gly	Gly	Val	Ser	Ala
	2015					2020					2025			
Arg	Val	Arg	Val	Gly	Gly	Ser	Ser	Ala	Val	Pro	Gln	Ala	Ala	Pro
	2030					2035					2040			
His	Arg	Asp	Ala	Glu	Leu	Ile	Ala	Glu	Val	Gly	Glu	Arg	Leu	Arg
	2045					2050					2055			



Glu Arg	Gly Glu Ala Met Arg	Leu <sup>1</sup> Leu Ala Glu Gly	Val Glu Leu
2060	2065	2070	
Arg Glu	Arg Ala Arg Pro Leu	Glu Arg Val Leu Ala	Glu Lys Leu
2075	2080	2085	
Ile Gly	Asp Arg Arg Thr Ser	Asp Ala Glu Glu Val	Ala Thr Glu
2090	2095	2100	
Pro Thr	Gln Val Arg Arg Asn	Ala Ala His Ser Arg	His Leu Asp
2105	2110	2115	
Ser Arg	Glu Ala Gln Leu Asp	Glu Arg Ala Ala Arg	Leu Arg Glu
2120	2125	2130	
Lys Glu	Gln Gln Leu Leu Arg	Val Ala Arg Glu Leu	Gln Thr Lys
2135	2140	2145	
Ser Arg	Ala Leu Gln Val Leu	Tyr Ala Arg Ala Leu	Asn Arg Pro
2150	2155	2160	
Gln Val	Thr Ser Leu Leu Leu	Thr Ala Asp Gly Asp	Asp Thr Ser
2165	2170	2175	
Tyr Pro	Asp Thr Pro Gln Gln	Gln Gln Gln Gly Thr	Arg Thr Pro
2180	2185	2190	
Leu Arg	Glu Pro Val Tyr Ser	Leu Asp Ser Glu Val	Ala His Tyr
2195	2200	2205	
Gly Arg	Thr Ala Gly Ala Ala	Val Ser Ser Gly Leu	Ala Ser Pro
2210	2215	2220	
Leu Pro	Arg Glu Pro Pro Arg	Ala Arg Met Val His	Arg Ala Val
2225	2230	2235	
Glu Ala	Thr Gly Thr Glu Glu	Asp Thr Gln Val Arg	Leu Thr Ala
2240	2245	2250	
Ala Thr	Glu Ala Tyr Arg Asp	Val Leu Tyr Glu His	Ile Leu Glu
2255	2260	2265	
Ser Asn	Gly Leu Gln Gly Val	Asp Val Leu Ala Gln	Tyr Leu Pro
2270	2275	2280	
His His	Thr Ser Gly Gly Gly	Leu Lys Thr Pro Arg	Leu Pro Gly
2285	2290	2295	
Ser Gly	Ile Ile Ser Lys Thr	Arg Ala Met Leu Arg	Ala Leu Glu
2300	2305	2310	
Glu Arg	Leu Gly Ala Ser Arg	Gly Val Gly Arg Gly	Val Asp Pro
2315	2320	2325	
Ala Val	Gln Glu Arg Ser Leu	Glu Ala Phe Arg Arg	Leu Glu Ala

2330

2335

2340

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 35 40 45  
 Cys Ser Lys Cys Ala Ala Thr Lys Thr Val Ile Pro Arg Tyr Tyr Ser  
 50 55 60  
 Asn Glu Thr Val Pro Val Cys Gln Arg Cys Tyr Gln Val Val Glu Arg  
 65 70 75 80  
 Tyr Lys Glu Arg Gly Ser Val Thr Pro Gly Tyr Val Val His Ser Thr  
 85 90 95  
 Thr Ile Ser Ala Thr Pro Ala Arg Ser Ser Pro Val Pro Pro Leu His  
 100 105 110  
 Thr Thr Pro Ala Leu Arg Pro His Ala Pro Ser Pro Gln Pro Ala Ser  
 115 120 125  
 Val Val Ser Thr Ala Thr Leu Val His Pro Val Glu Glu Asp Ala Val  
 130 135 140  
 Ser Thr Lys Pro Ser Val Ser Glu Ala Asp Leu His Ala Leu Arg Ser  
 145 150 155 160  
 Ile Ile Glu Thr Leu Gln Gln Ala Leu Asn Asp Glu Gln His Asn Ala  
 165 170 175

Ala Leu Ala Ala Thr Ser Ala Ala Glu Gln Leu Arg Thr Ala Lys Glu  
 180 185 190  
 Glu Asn Thr Ala Leu Lys Ser Thr Ala His Leu Leu Gln Gln Arg Leu  
 195 200 205  
 Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Gln Val Ala Arg  
 210 215 220  
 Leu Ala Ala Asp Arg Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala  
 225 230 235 240  
 Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu  
 245 250 255  
 Leu Glu Ala Arg Val Ala Arg Leu Ala Ala Asp Arg Asp Glu Ala Arg  
 260 265 270  
 Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr  
 275 280 285  
 Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Gln Val Ala Arg Leu Ala  
 290 295 300  
 Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln  
 305 310 315 320  
 Arg Ala Glu Leu Glu Ala Gln Leu Ala Arg Leu Ala Ala Asp Arg Asp  
 325 330 335  
 Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg  
 340 345 350  
 Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Gln Val Ala  
 355 360 365  
 Arg Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala  
 370 375 380  
 Thr Gln Gln Arg Ala Glu Leu Glu Ala Arg Val Ala Arg Leu Ala Ala  
 385 390 395 400  
 Asp Arg Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu  
 405 410 415  
 Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala  
 420 425 430  
 Gln Val Ala Arg Leu Ala Ala Asn Arg Asp Glu Ala Arg Gln Gln Leu  
 435 440 445  
 Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln  
 450 455 460  
 Gln Arg Ala Glu Leu Glu Ala Gln Val Ala Arg Leu Ala Ala Asp Arg

465		470			475		480
Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln							
	485			490			495
Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Arg Val							
	500			505			510
Ala Arg Leu Ala Ala Asp Arg Asp Glu Ala Arg Gln Gln Leu Ala Ala							
	515			520			525
Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg							
	530			535			540
Ala Glu Leu Glu Ala Arg Val Ala Arg Leu Ala Ala Asn Ala Glu Glu							
	545			550			555
Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu							
	565			570			575
Ala Gln Val Ala Arg Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg							
	580			585			590
Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Arg Val Ala							
	595			600			605
Arg Leu Ala Ala Asp Arg Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn							
	610			615			620
Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala							
	625			630			635
Glu Leu Glu Ala Gln Leu Ala Arg Leu Ala Ala Asp Gly Asp Glu Ala							
	645			650			655
Arg Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp							
	660			665			670
Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Arg Val Ala Arg Leu							
	675			680			685
Ala Ala Asp Arg Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala Glu							
	690			695			700
Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu							
	705			710			715
Glu Ala Gln Leu Ala Arg Leu Ala Ala Asp Arg Asp Glu Ala Arg Gln							
	725			730			735
Gln Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala							
	740			745			750
Thr Gln Gln Arg Ala Glu Leu Glu Ala Arg Val Ala Arg Leu Ala Ala							
	755			760			765



Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Arg	Val	Ala	Arg	Leu	Ala
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Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu
1070						1075					1080			
Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu
1085						1090					1095			
Leu	Glu	Ala	Arg	Val	Ala	Arg	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu
1100						1105					1110			
Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu
1115						1120					1125			
Ala	Gln	Val	Ala	Arg	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln
1130						1135					1140			
Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Arg
1145						1150					1155			
Val	Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	Leu
1160						1165					1170			
Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr
1175						1180					1185			
Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Val	Ala	Arg	Leu	Ala	Ala
1190						1195					1200			
Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln
1205						1210					1215			
Arg	Ala	Glu	Leu	Glu	Ala	Gln	Leu	Ala	Arg	Leu	Ala	Ala	Asp	Arg
1220						1225					1230			
Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln
1235						1240					1245			
Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala
1250						1255					1260			
Gln	Val	Ala	Arg	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg
1265						1270					1275			
Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Arg	Val
1280						1285					1290			
Ala	Arg	Leu	Ala	Ala	Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala
1295						1300					1305			
Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln
1310						1315					1320			
Gln	Arg	Ala	Glu	Leu	Glu	Ala	Arg	Val	Ala	Arg	Leu	Ala	Ala	Asp

1325	1330	1335
Gly Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu		
1340	1345	1350
Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu		
1355	1360	1365
Ala Gln Val Ala Arg Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln		
1370	1375	1380
Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Arg		
1385	1390	1395
Val Ala Arg Leu Ala Ala Asp Arg Asp Glu Ala Arg Gln Gln Leu		
1400	1405	1410
Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr		
1415	1420	1425
Gln Gln Arg Ala Glu Leu Glu Ala Gln Val Ala Arg Leu Ala Ala		
1430	1435	1440
Asp Arg Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala Glu Glu		
1445	1450	1455
Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu		
1460	1465	1470
Glu Ala Arg Val Ala Arg Leu Ala Ala Asp Gly Asp Glu Ala Arg		
1475	1480	1485
Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln Arg Leu Asp		
1490	1495	1500
Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Gln Leu Ala Arg		
1505	1510	1515
Leu Ala Ala Asp Arg Asp Glu Ala Arg Gln Gln Leu Ala Ala Asn		
1520	1525	1530
Ala Glu Glu Leu Gln Gln Arg Leu Asp Thr Ala Thr Gln Gln Arg		
1535	1540	1545
Ala Glu Leu Glu Ala Arg Val Ala Arg Leu Ala Ala Asp Gly Asp		
1550	1555	1560
Glu Ala Arg Gln Gln Leu Ala Ala Asn Ala Glu Glu Leu Gln Gln		
1565	1570	1575
Arg Leu Asp Thr Ala Thr Gln Gln Arg Ala Glu Leu Glu Ala Arg		
1580	1585	1590
Val Ala Arg Leu Ala Ala Asp Arg Asp Glu Ala Arg Gln Gln Leu		
1595	1600	1605

Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr
1610						1615					1620			
Gln	Gln	Arg	Ala	Glu	Leu	Glu	Ala	Gln	Leu	Ala	Arg	Leu	Ala	Ala
1625						1630					1635			
Asp	Arg	Asp	Glu	Ala	Arg	Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu
1640						1645					1650			
Leu	Gln	Gln	Arg	Leu	Asp	Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu
1655						1660					1665			
Glu	Ala	Gln	Leu	Ala	Arg	Leu	Ala	Ala	Asp	Gly	Asp	Glu	Ala	Arg
1670						1675					1680			
Gln	Gln	Leu	Ala	Ala	Asn	Ala	Glu	Glu	Leu	Gln	Gln	Arg	Leu	Asp
1685						1690					1695			
Thr	Ala	Thr	Gln	Gln	Arg	Ala	Glu	Leu	Glu	Val	Glu	Met	Ala	Val
1700						1705					1710			
Leu	Leu	Arg	Glu	Arg	Glu	Glu	Ala	Arg	Gly	Glu	Thr	Ala	Val	Ala
1715						1720					1725			
Gly	Glu	Gln	Val	Gln	Leu	Tyr	Arg	Glu	Thr	Val	Glu	Glu	Glu	Glu
1730						1735					1740			
Cys	Leu	Lys	Glu	Glu	Arg	Trp	Cys	Leu	Glu	Ser	Arg	Val	Ala	Gln
1745						1750					1755			
Leu	Arg	Glu	Ala	Ser	Ala	Ala	Ala	Lys	Gln	Gln	Arg	Gln	Glu	Val
1760						1765					1770			
Ala	Ala	Lys	Ala	Asn	Glu	Val	Gln	Glu	Arg	Leu	Asp	Ser	Met	Ala
1775						1780					1785			
Arg	Arg	Cys	Ile	Ala	His	Glu	Gly	Asp	Ala	Pro	Gln	Arg	Ala	Asp
1790						1795					1800			
Gly	Arg	Asp	Asp	Ala	Leu	Arg	Gln	Leu	Ala	Asn	Leu	Arg	Glu	Glu
1805						1810					1815			
Val	Lys	Leu	Ser	Glu	Lys	Gln	Lys	Ala	Met	Glu	Arg	Val	Ile	Pro
1820						1825					1830			
Gly	Val	Arg	Glu	Arg	Gln	Met	Arg	Leu	Glu	Ala	Ala	Glu	Glu	Gln
1835						1840					1845			
Arg	Ala	Asp	Leu	Glu	Ala	Arg	Leu	Val	Asp	Glu	Ala	Gly	Asp	Leu
1850						1855					1860			
Arg	Ser	Arg	Pro	Ala	Ala	Ser	Thr	Asn	Glu	Val	Asn	Leu	Tyr	Arg
1865						1870					1875			







Gly Asp Val Glu Gly Ser Lys Lys Val Arg Arg Arg Val Arg Glu Ala  
35 40 45

Leu Leu Lys Ser Ser Asp Asp Ser Glu Ala Met Ser Lys Val Asp Asp  
50 55 60

Ile Ile Arg Arg Gly Lys Arg Thr Gln Ser Lys Leu Asp Gly Ser Tyr  
65 70 75 80

Asp Glu Arg Gln Arg Leu Lys Arg Lys Arg Arg Glu Glu Asp Leu Ala  
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Glu Gly Ser Ala Ser Thr Glu Glu Asp Gly Thr Glu Asp  
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Val Gly Asp Phe Arg Arg Val Ile Glu Glu Leu Thr Pro Gly Met  
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Ile Val Pro Val Arg Ile Asn Arg Gly Gly Val Ala Met Val Val Thr  
35 40 45

Val Arg Val Glu Ala Gly Arg Ser Leu  
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Val Lys Ala Cys Asn Asp Arg Ser His Arg His Thr His Thr His Thr
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His Thr Asn Ser Phe Val Ser Gly Asp Val Phe His Val Trp Arg Val
          35          40          45

Arg Ser Phe His Ser Ala Pro Ser Val Phe Phe Cys Phe Ser Val Cys
          50          55          60

Thr His Leu Leu Phe Ser Pro Ser Ser Pro Tyr Ala His His Ala Arg
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Val Cys Val Arg Ala Cys Val Cys Val Cys Val Cys Val Val
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Pro Leu Leu Lys His Tyr Ser Arg Gly Met Ala Ser Ser Gly Ser Ala
          20          25          30

Lys Asp Asp Ala Leu Phe Leu Val Arg Arg Pro Lys Tyr Leu Val Ala
          35          40          45

Gln Ala Val Asn Leu Ser Gly Ser Val Val Phe Phe His Ser Leu Arg
          50          55          60
  
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Glu	Val	Asp	Val	Ser	Val	Gly	Ser	Ile	Val	Val	Asn	Ser	Leu	Ala	Phe
65					70					75					80
Val	Ile	Thr	Val	Leu	Met	Ser	Val	Leu	Val	Leu	Arg	Glu	Gly	Leu	Leu
				85					90					95	
Arg	Ala	Arg	Thr	Thr	Ala	Gly	Cys	Leu	Leu	Val	Met	Val	Gly	Thr	Ala
			100					105					110		
Leu	Cys	Thr	Tyr	Ser	Ser	Ser	Ala	Ser							
	115							120							

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